EXPLORATIVE STUDY INTO VALUATION METHODS FOR DUTCH PRIVATELY HELD ENTERPRISES: A SURVEY

Abstract

In this study the comparisons and differences among private equity valuators, private firm valuators, and public firm valuators regarding their preferred methodologies in valuation. This analysis focuses from a general perspective (valuation method) to more a more detailed analysis (multiple types & DCF components). Lastly, it aims to explain why the differences are observable using (multinomial) logistic regressions. Significant difference among preferred valuation methods are found to exist among the sub-groups and these are partially contributable to valuator roles, valuation purpose, valuation characteristics and information asymmetries as faced by the valuator.

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1. Introduction

> *"Value should not be confused with price, which is the quantity agreed between the seller and the buyer in the sale of a company" (Fernández, 2007: 2).*

The actual value of a firm is generally different for buyers and seller, as there is a certain subjectivity in applying valuation models to the firm at hand. Next to the subjectivity there is the broad spectrum of valuation methods that can be applied to value firms.

Based on reports of Baker-McKenzie Partners the global overall M&A activities in 2019 dealt with a value of 2.8 trillion dollars and is expected to have a short-term downfall in 2020 with an expected value of 2.1 trillion dollars before recovering in 2021[1]. These numbers do not include general valuations, valuations in purpose of acquiring finances or valuations conducted for management performance reviews. In the Netherlands, the value of the M&A market increased during 2009 to 2017, from 36 billion euros to 51 billion euros with 2015 as a peak-year with a total deal value of 179 billion euros[2]. Neglected in this figure is the value of the M&A market for small enterprises, which makes up 75% of the M&A transactions in the Netherlands[3]. Based on reports of Baker-McKenzie and KPMG the expectation is the Dutch M&A market will follow the same trend as the global trend, as due to a peak in global political pressure and Brexit the market will first dip before it recovers from 2021 onwards. These figures cover both public and privately held firms and also exclude the value of the firm valuation industry that is not based around mergers & acquisitions, the market as well as its importance is therefore even larger.

'A privately held firm does not have publicly traded equity' (Bargeron, Schlingemann, Stulz & Zutter, 2008: 375). A public firm is then defined as a firm that does indeed have publicly traded equity. According to figures of CBS (Statistics Netherlands) privately held firms make up more than 99% of all firms, which is consistent with other studies and countries (Dukes, Bowlin, & Ma, 1996; Petersen, Plenborg, & Schøler, 2006). The size of this industry would make one think that this subject is well covered, and as Damodaran (2006: 694 already noted that 'the research into valuation models and metrics in finance is surprisingly spotty'. Whereas there currently are many more practitioner-oriented research firms that publish studies on valuations and deal-making procedures, there is only little scientific research, especially on privately held firm valuation in the Netherlands. This may be due to data availability problems, as these firms are not obliged to disclose their annual figures as extensive as their public counter parts.

Data availability problems are commonly solved by applying a survey as data collection method in an explorative research attempt. Brounen, De Jong, and Koedijk (2006) researched capital structure policies in Europe based on a survey entailing 313 European CFOs. This paper was a follow-up on Brounen, De Jong, and Koedijk (2004), where they confronted the corporate finance theory with practice using a similar survey and sample. Graham and Harvey (2001) surveyed 392 CFOs about their policies regarding the cost of capital, capital budgeting and capital structure. Bancel and Mittoo (2004) conducted a survey among managers in 16 European countries regarding the determinants of capital structure. Block (1999) researched 297 Association for Investment Management and Research (AIMR)

[1] https://www.bakermckenzie.com/-/media/files/insight/publications/2019/03/gtf19_tmt.pdf?la=en

[2] https://www.consultancy.nl/nieuws/16971/aantal-fusies-en-overnames-in-nederland-op-hoogste-punt-in-tien-jaar

[3] https://www.brookz.nl/files/barometers/overname_barometer_2019_h2.pdf

members. He researched the most commonly used valuation approaches in practice of financial analysts. Dukes et al. (1996) conducted a survey regarding the valuation of privately held firms in the United States. Most studies find that some form of discounted cashflow (DCF) methods or multiples are commonly used by practitioners, however these results seem to vary over time and for demographic areas. The Netherlands has never been subject to such a study. Therefore, **the research questions** of this thesis are: **(1)** What valuation models are used by valuators in valuations of privately held firms in the Netherlands? **(2)** How are these models applied? **(3)** What factors affect valuation model selection?

Following these research questions I select a survey as my method of data collection. I describe the similarities and differences between the sub-samples, and I conduct a multinomial logit regression that predicts the choice of valuation model based on valuator- and firm characteristics as well as the reason of valuing. I have found two European survey-based studies that are congruent with my subject, however to which a more academic perspective can be added. The first is Petersen et al. (2006), who conducted research on the valuation methods used in the valuation of privately held firms in Denmark by (in)dependent financial analysts and private equity analysts. In a similar vein Vydržel and Soukupová (2012) researched the methods used in valuing privately held firms in the Czech Republic.

The primary objective of this thesis is to survey the extent to which three sub-samples use valuation techniques in practice for privately held firms. The sub-samples are listed firm-focused valuators, non-listed firm focused valuators and private equity valuators. This divide is made following literature as a valuator role might lead to differences in valuation methodology. Private equity valuators are included in the sample as many non-listed firms seek private equity capital injections for their firms, their economic and theoretical importance can therefore not be neglected, as well as them having a different driver of motivation to value firms. By filling in the clear academic research gap of privately held firm valuation, focusing on a different geographic than prior research and surveying a larger sample size (100 participants) this study contributes to financial theory. The sheer economic size of the M&A- and valuation market showcase the relevance and the impact of scientific research into the applied methods in privately held firm valuation by various types of valuators. This study contributes to practitioners understanding of valuation methods that are applied across groups and across markets, this allows them to evaluate their own methodologies as well as providing insights on how to adhere (more) to proposed literature.

I find that on a general level the sample adheres quite closely to the literature. DCF is the preferred method of most valuators, whilst transaction multiples (EV/EBITDA) follow closely. The APV is the specific DCF variant which is applied by 80% of the sample, which allows valuators to highlight capital structure changes. Looking closer into the application of the sub-components of the DCF I find that in practice prescribed literature is not always followed by all sub-groups. I find supporting evidence that private firm effects causes valuators to change part of valuation methodologies. I also find supporting evidence that different valuator types tend to use different valuation methodologies, which affect fundamental value. Information asymmetry causes valuators to prefer multiples, however DCF usage is unaffected. Private firm valuators tend to have more within-group dispersion regarding valuation methodologies than private equity valuators, and seemingly follow literature closer. This might be an educational effect or because they have a wider range of valuation purposes for which they require more methodologies. Client orientation is not significantly affecting valuation method selection.

2. Literature review

In the introduction I mentioned how value and price are two very different concepts in the world of firm valuation. Price is the quantity that is agreed upon by buyer and seller, whereas the actual value can be different for the involved parties, as the value is affected by subjective factors that are included in the valuation. Also the valuation model that is used by a party can cause significant differences in the perceived value of the firm (Demirakos, Strong, Walker, 2009).

The traditional way of stock pricing is similar as how a bond is valued, based on the expected returns that an investment generates. For bonds this return comes from interest payments and the repayment of face value at maturity. Stock returns consists of paid dividends and the change in stock price at the moment of selling in the future. These expected future returns must then be discounted back to their current worth (i.e. present value), by using a required discount rate (i.e. cost of equity). The method of discounting expected dividends is the first cash flow-based method or discounted cash flow method (DCF). It is based on the actual value of the firm or its intrinsic value, however a firm's value can also be based on relative values compared to other firms. Before continuing I provide an overview of the various valuation methods, divided into four groups: **(1)** Cash flow-based, **(2)** multiples, **(3)** profit-based, **(4)** asset-based. As prior literature shows that practitioners appoint most importance to relative valuation (multiples) and DCF I conduct a deep dive into specific build-up of these methods.

2.1 Valuation methods

2.1.1 Cash flow-based

The first category consists of cash flow-based methods or Discounted Cash Flow (DCF) models. These valuation models revolve around the principle that is described by Damodaran (2006: 696) as "the value of an asset is the present value of the expected cashflows on the asset, discounted back at a rate that reflects the riskiness of these cashflows" (i.e. Discounted Cash Flow). Demirakos, Strong, and Walker (2004) found that the DCF method is widely used by valuators in the UK and is seen as a more 'sophisticated model' compared to market multiples and asset-based approaches. The DCF is seen as such because it requires more information about the valued firm to cover all variables in the model. Damodaran (2007) notices that the last 50 years, the discounted cash flow models have extended their reach into security and business valuation. He distinguishes four variants of discounted cash flow models in practice; (1) risk-adjusted discount rates are used to discount expected cash flows of an asset (or business), (2) expected cash flows are adjusted for risk to arrive at risk-adjusted or certainty equivalent cash flows, (3) first the business is valued, without effects of debt, then consider marginal effects on value or the debt liabilities, this is known as the adjusted present value approach (APV), (4) lastly, the function of the excess returns a business is expected to generate on its investments, also known as Economic Value Added (EVA). In the following I will try to deepen the understanding of these four variants:

The first variant is the risk-adjusted discount rate that is used to discount forecasted cash flows. This risk-adjusted discount rate can be applied in two manners to the forecasted cashflows, on the firms as a whole or on the equity of the firm. Its origins lay in the Dividend Discount Model (DDM).

"The dividend discount model (DDM) states that the price for an asset is the value of all the future payments it is expected to provide, discounted at the appropriate rate" (Foerster & Sapp, 2005: 56). The dividend discount is the oldest DCF model and is based on the idea that all nominal annual

dividends, that are expected to be paid out by the firm in the period, are discounted at the corresponding discount rate. These dividends can be actual dividends or potential dividends that are in fact retained by the firm for new investments. Damodaran (2006: 701-705) mentions that "while many analysts have turned away from these models on the premise that they yield estimates of value that are far too conservative, many of the fundamental principles that come through with dividend discount models apply when we look at other discounted cash flow models". He continues by stating that "the assumption that the pay-out ratio is constant … makes this an inappropriate model to use for any firm that has low or no dividends currently", therefore the applicability of the original model is quite limited. However, by adding buybacks to the dividends and taking away increased financial leverage, a modified dividend pay-out can be calculated, this is a form of an adjusted DDM. A second option is "to measure the cash flow over all reinvestment needs and debt payments", this is results in the free cash flow to equity model (FCFE).

Barker (1999) also finds evidence that valuators have shied away from the DDM method. He found that this model's practical importance in making investments decisions was regarded, by fund managers, as 'hardly important' or 4 out of 5, where 5 is having least practical importance. By valuators it was even regarded less with a 7 out of 7 (7 least practical importance). Contrary to other research he found that the DCF method (FCFF & FCFE) was similarly disregarded for having practical importance with scores of 4 (out of 5) by fund managers and 6 (out of 7) by valuators. The method holding most practical importance in this research was found to be the Price-Earnings (PE) ratio. The formula of the dividend discount model is depicted below, where $E(DPS_t)$is the expected dividends per share in period t and k_e is the cost of equity. It allows for flexible time-varying discount rates in case risk differences for various time periods.

$$Value\ per\ share = \sum_{t=1}^{\infty} \frac{E(DPS_t)}{(1+k_e)^t}$$

As mentioned, one can rewrite the DDM so that the cash flow is measured over all reinvestment needs and debt payments, this is known as 'the free cash-flow to the equity' (FCFE). This refers to the amount of cash flow that is available for distribution to the firm's equity holders. "The primary difference between equity and debt holders in firm valuation models lies in the nature of their cash flow claims – lenders get prior claims to fixed cash flows and equity investors get residual claims to remaining cash flows" (Damodaran, 2007: 720). It is calculated by taking the net income after tax that could be paid out, however the depreciation and amortization expenses are no cash outflows and are therefore also available for equity holders in a sense, so these should be added. An increase in debt frees up money for equity holders and is therefore an addition to net income, whereas an increase in net working capital and capital expenditures tightens the available money for shareholders and subsequently subtracted from the net income. FCFE is a calculation of the equity value, but an analyst can also calculate the value of the enterprise as a whole, for example by using the free cash flow to the firm (FCFF). Damodaran (2007) compares the two approaches and concludes that 'the advantage of using the firm valuation approach is that cashflows relating to debt do not have to be considered explicitly, since the FCFF is a pre-debt cashflow, while they have to be considered in estimating FCFE. In cases where the leverage is expected to change significantly over time, this is a significant saving, since estimating new debt issues and debt repayments when leverage is changing can become increasingly

difficult, the further into the future you go. It does however require more information to estimate the actual WACC of a firm. FCFE is calculated as follows:

$$FCFE = NI + DEP\&AMOR + \Delta D - \Delta NWC - CAPEX$$

A second way to calculate the FCFE of a firm is by taking the FCFF, add back the interest (I) expense whilst decreasing it by the tax savings on interest (1-T), add on the new debt proceedings and take away the paid principal on long-term loans (ΔD) (Fernandez, 2007).

$$FCFE = FCF + I\,(1 - T) - \Delta D$$

"The free cash-flow to the firm (FCFF) represents the available money available for distribution to the various claimants (debt and equity) after paying all the firm's expenses and investments in new projects" (Titman & Martin, 2014: 27). It originates from 1958 and was first described in Modigliani and Miller (1958), who stated that an asset is worth its future after-tax operational income streams discounted for its given uncertainty at the cost of capital. "The discount rate reflects the cost of raising both debt and equity financing, in proportion to their use" (Damodaran, 2007: 7). The formula for FCFF is provided below.

$$FCFF = NOPAT + DEP\&AMOR - Capex - \Delta NWC$$

"Since the discount rate to be used later is the after-tax weighted average cost of capital, the appropriate cash flows are before the tax advantage of debt. To account for the tax advantage of debt-financing the discount rate is reduced, rather than by including the interest tax shield in the cash flow to investors" (Shrieves & Wachowicz Jr, 2001: 6). Therefore, in this approach are both the tax benefits and the bankruptcy costs implicitly embedded in the cost of capital (Damodaran, 2007: 25). The generic FCFF assumes a stable growth and no reinvestments, however if these situations do happen, the model should be adjusted. The model is then to be split up in various stages with discount rates that are projecting the risk appropriate for that specific period. The amount of stages is depending on the timing of the firm to reach a stable growth rate. This terminal value in FCFF is calculated as:

$$\text{Terminal Value} = \sum_{t=n+1}^{\infty} \frac{FCF_t}{(1+r)^t}$$

The second variant is the risk-adjusted cashflow or certainty equivalent cashflows. Instead of adjusting the discount rate in a DCF model, one can also adjust the future cashflows for their respective risks. "While most analysts adjust the discount rate for risk in DCF valuation, there are some who prefer to adjust the expected cash flows for risk. In the process, they are replacing the uncertain expected cash flows with the certainty equivalent cashflows, using a risk adjustment process akin to the one used to adjust discount rates … adjusting the cash flow, using the certainty equivalent, and then discounting the cash flow at the risk-free rate is equivalent to discounting the cash flow at a risk adjusted discount rate" (Damodaran, 2007: 725). However, if the approximation for the risk premium computed as the difference between the risk-adjusted return and the risk-free rate is used, this equivalence will no longer hold. Then the certainty equivalent approach will give lower values for any risky asset and the difference will increase with the size of the risk premium. Also when the risk-free rates and risk premiums change over time, certainty equivalents yields more precise estimates of value, lastly in case of negative cash flows certainty equivalents produce results more consistent results with

intuition as “they can yield certainty equivalents that are negative and become more negative as you increase risk” (Damodaran, 2007: 730-731). The benefit of this method is that it allows for more flexibility and for the inclusion or exclusion of certain options, such as big investment projects for which it would normally be difficult to determine a cost of capital. The risk premium can be equal to the discount rate. The certainty equivalent value (CEQ) is the amount for which investors are indifferent between a risk-free investment and the risky investment ‘V_1’.

This method is based on utility models, where people are expected to be risk averse and more inclined to certainty equivalents of cash flows rather than uncertain cash flows. The utility models themselves have only little practical importance as defining a precise utility function is nearly impossible and tend to be not very good at explaining behaviour, and besides for an asset to be valued this way, all scenarios regarding this asset for all time periods have to be analysed with their probabilities, which is incredibly difficult.

$$PV_{CEQ_0} = \frac{E_0[V_1] - (Risk\ premium\ v)\mathrm{PV}[V_1]}{(1 + \text{risk free rate})} = \frac{CEQ_0[V_1]}{1 + rf}$$

In the third variant, which is the Adjusted Present Value (APV) first the business is valued cash- and debt free, the marginal effects on value and debt are then separately calculated. The APV can be implemented similarly as the FCFF approach, however the value of the unlevered free cash flows is separately calculated from the value of the interest tax savings. “The APV method gives the advantage of clarity regarding the impact of the capital structure on the enterprise value” (S. Titman, Martin, J., 2014: 219-226).

“The value of the company without debt is obtained by discounting the free cash flow, using the rate of required return to equity that would be applicable to the company if it were to be considered as having no debt, or known as the unlevered rate (K_u)” (Fernández, 2007: 856). Logically, the required return to equity (K_e) is lower than K_u for a firm that has debt as now the shareholders bear the financial risks that exist because of the debt attracted by the firm. If there is no debt in a firm $K_u = K_e = WACC$. The tax shield can be calculated by multiplying the payable interest with the corresponding tax rate. Discounting the tax shield to its present value is still somewhat controversial, according to Fernández, as many authors suggest using the debt’s market cost, which need not necessarily be the interest rate at which the company has contracted its debt. Fernández (2004) already made a case to calculate the present value of the tax shield as the difference between the present value of the taxes of the unlevered company and the present value of the taxes of the levered company, which represent two separate cash flows each with their own risk. Then the value of tax shields is the present value of the debt times the tax rate times the required return to the unlevered equity, all discounted at the unlevered cost of equity. He compares his method to those of Myers (1974) and Modigliani and Miller (1963) who made cases for discounting tax shields at the cost of debt and at the risk-free rate, respectively.

Kaplan and Ruback (1995) researched the comparison between the discounted value of forecasted cash flows and the actual market value of highly leveraged transactions (HLT) in public firms. They found that DCF methods individually, perform at least as well as the comparable methods. As said, they compared the results of the DCF method to the method of comparables or multiples. Whilst concluding that the DCF method is both useful and reliable even under HLT’s, they also find the comparables approach to be useful. A hybrid method between the two approaches especially provides

a good use for the comparable approach. To value firms in this study, they used a Compressed Adjusted Present Value Technique (Compressed APV) which is the APV method with the addition of assuming that the firm is all-equity financed and discounting the interest tax-shields at the discount rate of that all-equity firm.

Lastly, the Excess return models, in this method "the cash flows are separated into excess return cash flows and normal return cash flows. Earning the risk-adjusted required is considered a normal return cash flows but any cash flows above or below this number are categorized as excess returns; excess returns can therefore be either positive or negative" (Damodaran, 2007: 731). The basic idea is then that the value of a business is equal to the capital invested in a firm presently and the present value of excess return cash flows from existing and future projects.

The most widely used excess return model is the economic value added (EVA) (Damodaran, 2007), which implies that the "the value of the debt plus that of the shareholders' equity is the book value of the shareholders' equity and the debt plus the present value of the expected EVA, discounted at the WACC". EVA is then calculated as the net operating profit after taxes (NOPAT) minus the company's book value that is timed by the WACC (Fernandez, 2007: 857).

$$EVA_t = NOPAT_t - (D_{t-1} + Ebv_{t-1}) * WACC$$

Fernandez (2001: 1-2) carried out a study regarding the usefulness of EVA as a measure of value creation during a period. By analysing the correlations or various valuation methods, among others, EVA and market value of companies, he found that EVA only in a few case (i.e. 18 out of 582) had a significant power to predict market values. For 210 out of the 582 the correlation between EVA and MVA (market value added) was even negative. He concludes "the EVA uses the book value of the company's debt and equity instead of the equity market value, and the ROA instead of the shareholder return. Therefore, it can come as no surprise that shareholder value creation has very little to do with the EVA, irrespective of whatever adjustments may be made to the accounting data used."

Economic value added is used very little by practitioners from other studies and requires valuators to make assumptions about which cash flows are normal and which are in excess to that. Also this method does only show the excess cash flows to required returns on book value, it does not show separated cash flows for operating-, financing- or investing cash flows. This unclarity is expected to be a limiting factor in the usability of the method. The APV method is expected to be used less than FCFE and FCFF as it requires more effort and information to split up the values for the hypothetical unlevered firm and the levered firm, to find the present value of the tax shield. Only if this split up is necessary to provide insights into the (changes in) the capital structure of a firm over time the APV is strongly recommended, as this is the case for presumably not all valuators it is expected to be used less. Lastly the certainty equivalent cash flow method is expected to be used less as it is mostly useful for project or option pricing but is harder and more time consuming to implement for the valuation of a whole firm. Pinto et al. (2019: 227) find that FCFF is used almost double as many times as the FCFE approach. They argue that "Analysts may prefer the FCFF valuation approach (over the FCFE approach) when they believe a firm's capital structure is changing or if they have more confidence in the discount rate for the FCFF approach (which is the cost of capital instead of the cost of equity used for the FCFE approach)". These findings of Pinto et al. (2019) are in-line with the earlier findings of Vydržel and Soukupová (2012) who found FCFF to be the most prevailing method of the DCF approaches for all

sub-groups (85-90% acceptance rate), the second most-used approach was the FCFE with an 50% acceptance rate.

2.1.2 Multiples

"This method first identifies a set of firms that are comparable to the firm being valued. For each comparable firm, a ratio (e.g. the ratio of its market price to revenue or earnings is calculated). These ratios are averaged, and/or the median value is determined. The value of the target firm is then equal to the average or median (e.g. revenue (earnings) multiple) multiplied by the target firm's value for this ratio (e.g. revenue (earnings))" (Feldman, 2005: 45). "The method of comparables (i.e. market multiples) is an attempt to argue by analogy that a private firm should have the same value as an identical public firm" (Beatty, Riffe, & Thompson, 1999: 178). Prior literature, however, describes that the valuation of privately held firms should be corrected for marketability and control premiums.

Lie and Lie (2002: 44) describe how "investment bankers and appraisers regularly use valuation by multiples, such as the P/E multiple, instead of or as a supplement to DCF analysis, as the DCF technique is often cumbersome to use and is sensitive to a host of assumptions". In their research they found that the accuracy of various multiple approaches and found that the asset multiple (market value to book value) generally generates more precise and less biased estimates than do the sales and the earnings multiples. When using earnings multiple, the EBITDA multiple is found to be more accurate than an EBIT multiple. This is, according to the authors, because "depreciation expenses distort the information value of earnings, perhaps because depreciation schedules do not accurately reflect the actual deterioration of asset value" (p. 47). In their research the accuracy of the multiples is assessed by estimating value by multiplying the median multiple for comparable companies by the relevant financial multiple for the company and adjusting this for cash levels, as recommended by Alford (1992). Then, the valuation errors are calculated as the natural logarithm of the ratio of the estimated value to the market value. Cheng and McNamara (2000: 351) also based their research on the comparable firm valuation method, and looked at the valuation accuracy of the P/E benchmark (Price/Earnings) and the P/B benchmark (Price/book value), and a combination of the two (P/E-P/B) for the value of public firms. They claim that "this combined P/E-P/B approach cannot only show the joint value relevance of earnings and book value, it also may have implications to value estimation for closely-held firms, if we can infer the usefulness of accounting information by the public firms to closely-held firms". They found that the P/E-P/B valuation method outperforms both P/E and P/B multiples.

Kaplan and Ruback (1995) found that practitioners often value companies using trading or transaction multiples, and that the EV/EBITDA is commonly used and a good proxy for value. The usage of this EV/EBITDA multiple is also described by Damodaran (2007: 755), as "when buying a business, as opposed to just the equity in the business, it is common to examine the value of the firm as a multiple of the operating income or the earnings before interest, taxes, depreciation, and amortization (EBITDA)". The EV/EBITDA was in the Czech private equity research of Vydržel and Soukupová (2012) also by far the most commonly used multiple (94% of the sample used this multiple, whereas EV/Sales as number two was only used by 55% of the sample).

Imam, Barker, and Clubb (2008) researched which valuation methods UK investment valuators (investment bankers) use to value businesses, why they use these specifically and how they apply them. They found that unsophisticated valuation models (i.e. multiples) are important when they are

based upon either earnings or cash flow, yet they are unimportant when based upon other variables. The DCF and the specific 'unsophisticated' method of P/E ratios were deemed to be 'very important' or 'extremely important' by their sample, whereas 'other multiples have only secondary importance'. However, they did not find that unsophisticated models (multiples) or sophisticated models (cash-flow models) dominated in their results. Demirakos et al. (2004) too found that P/E ratios or multi-period models such as DCF are used as a dominant method in business valuations, however note that P/E to growth (i.e. PEG) ratios are used more often to value businesses in stable growth industries as to highly growing industries.

The multiples used in this approach can be derived based on two principles: transaction- or market multiples. Transaction multiples are based on successful transactions in the takeover of a comparable firm or a set of comparable firms. Market multiples are based on the premise that comparable public firms should in principle have the same value as privately held firms except for the earlier mentioned altercations for marketability and control premiums, these extra risks should be considered after the first comparison calculation. Therefore, multiples calculated for the comparable public firm can be applied on the privately held firm in its valuation. Palea (2016) mentions a form of survivor bias in the transaction multiples, as only successful transactions and are considered in this form of multiples, thereby realizing higher equity values than market multiples. Furthermore, transaction multiples incorporate synergy expectations as well as other positive factors that increase transaction prices. In the study of Vydržel and Soukupová (2012) transaction multiples were for all sample groups equally or more popular than market multiples. A note for their research is however that some respondents objected against the use of transaction multiples due to the lack of relevant and sufficient data related to the Czech market.

Pinto et al. (2019) conducted a deep dive into the use of the DCF approach and the multiples approach, regarding multiples they found that 92.8% of their sample of CFA members used market multiples in their valuations, however their sample includes both public and private firm valuators. Transaction multiples are used a lot less, contrary to what Vydržel and Soukupová (2012) find. This might be a privately held firm effect or due to sample differences. The most used multiples are P/E and enterprise value or firm value multiples (EV/EBITDA or EV/Operating profit), with 88.1% and 76.7% usage by their sample, respectively. This is in accordance with Lie and Lie (2002) and Cheng and McNamara (2000). According to Pinto et al. (2019) the high use of EV multiples is noteworthy as they find that EV multiples generally receive sparse attention in US textbooks on investments.

2.1.3 Asset-based

"The asset-based method first identifies a firm's tangible and intangible assets and values. The sum of these values is then equated to the value of the firm" (Feldman, 2005: 45). Damodaran (2007) states that the value of an asset in the discounted cash flow framework is the present value of the expected cash flows on that asset. Extending this proposition to valuing a business, it can be argued that the value of a business is the sum of the values of the individual assets owned by the business. "Asset-based approaches develop an estimate of company value based on the appraised value of its asset" (DeAngelo, 1990: 100) This approach can also be used to value companies with material real estate and/or natural resource holdings.

Damodaran (2006: 56-57) mentions two methods to calculate the value of a firm with the asset-based approach. "One is liquidation value, where you consider what the market will be willing to pay for

assets if the assets were liquidated today. The other is replacement cost, where you evaluate how much it would cost you to replicate or replace the assets that a firm has in place today". "liquidation valuation, values assets based upon the presumption that they have to be sold now. In theory, this should be equal to the value obtained from discounted cash flow valuations of individual assets, but the urgency associated with liquidating assets quickly may result in a discount on the value" (Damodaran, 2006: 751). Some authors mention book value to be a proxy for liquidation value (Berger, Ofek, & Swary, 1996; Lang, Stulz, & Walkling, 1989), however other authors found evidence for serious discounts due to the speed and urgency in selling the assets in a liquidation situation (Kaplan, 1989; Shleifer & Vishny, 1992). All in all, the liquidation approach provides the user with more realistic estimates in case a firm is distressed, however is rather conservative when a firm has plenty growth opportunities (Damodaran, 2007: 752). (Damodaran (2012) regards two limitations of this asset-based approach in case it is used for valuing a firm that is valued as an ongoing concern, first he agrees that this method does not assign any value to expected future growth and the excess returns that would flow from that growth. The second limitation is that companies in multiple branches should value their assets separately for the different industries with different income streams and different discount rates as assets hold different values in different industries.

Pinto et al. (2019) found that 61.4% of their sample used an asset-based approach, that could include book value, adjusted book value, asset market values or asset replacement costs. They see that, although theory prescribes the use of this method only in specific situations that the adoption is surprisingly high. In the same Table (i.e. Table 1) they do find that although 61.4% of the valuators sometimes uses the asset-based method, only 36.8% of the valuators uses this approach in each valuation, supporting the idea that there are only specific instances where this method should be applied.

2.1.4 Profit-based

Within the simplified abnormal profit model the average historical returns are held constant for future years. These returns are discounted at the rate of return of the investors. The assumption in this model is that the capital structure, profitability of the assets and reserves remain stable. In professional spheres this method is often critiqued for being too simplistic as well as having various fundamental assumptions that are questionable. The most common critiques are; (1) the method is based on historical profits and those do not provide guarantee for future profits, (2) the net profit can manipulated on the profit and loss statement, (3) there is no flexibility in the model for a fluctuating capital structure, (4) there is too little eye for the time value of money (Denneboom, 2007). He continues that most of these critiques are dealt with in the improved abnormal profit method.

In this method there is also a forecast of the future profits based on the (average) historical returns, but these are normalised for spontaneously generated funds and manipulation of net profits in the historical returns. Furthermore, there are adjustments for the capital structure in the firm, depreciation and amortization and additions or subtractions of the reserves and provisions. This improved abnormal profit model is therefore better focused on future scenarios; however it does neglect future investments and their respective added cashflows and profits[4]. (Denneboom, 2007) describes two critiques on this improved abnormal profit model. In this method the economic value of equity is adjusted for the solvency requirement. This solvency requirement is based on the

[4] https://www.powerfinance.nl/Waarderingen.pdf

bookvalue of equity, whilst it later is adjusted in the economic value of the equity. This creates an inconsistency in the actual value of equity. Secondly, he adds to the earlier critique of the neglect of future investments and their respective added cashflows and profits, he states that indeed in this method there is no possibility to calculate the time value of future investments and depreciations as well as volatility in the cashflows and profits. Therefore, he deems this method less applicable for volatile or capital-intensive firms, however for stable firms who are close to the point where capital expenditures are equal to the annual depreciation expenses, this method might have practical relevance.

To conclude the valuation method section I would like to provide a brief summary, as well as expectations coming from the literature. Petersen et al. (2006) found DCF to be the most important and accepted valuation method by valuators, however they neglected the use of multiples fully, Vydržel and Soukupová (2012) find transaction multiples and DCF methods to be most important (i.e. primary valuation method) by a remarkable distance. The importance of multiples and present discounted value approaches over asset-based approach, options approaches and other approaches is supported by the findings of Pinto et al. (2019), they however find that market multiples are used more than transaction multiples. All these studies also find that professional valuators use various valuation methods in congruence and select one as a primary valuation methodology. Based on the empirical findings regarding the deemed importance of DCF and multiples, it is expected these are used most and together for a final valuation. The DCF is expected to be seen as the primary valuation methodology.

2.2 DCF Components

In the research of Vydržel and Soukupová (2012) the methods of transaction multiples (91% of the sample used this method) and DCF (89%) were most popular among all sample groups, followed by market multiples (73%). Where from the types of financial advisors (listed firm focused and non-listed firm focused valuators) 100% and 95% of the respondents made use of the DCF method, this was only 78% for the private equity valuators. Other studies also find that either DCF or multiples are used most by practitioners, with varying outcomes which model of the two is dominant in case both are used (Demirakos et al., 2004; Feldman, 2005; Petersen et al., 2006; Fernandez, 2007; Imam et al., 2008; Pinto et al., 2019). In the following I will take you through the components of the DCF valuation approach.

2.2.1 Cost of Capital

The cost of capital in the DCF approach is the expected rate of return that investors forgo from alternative investment opportunities with equivalent risk. Given this, the cost of capital is the discount rate with which the forecasted cash flows are calculated back to their present value. The cost of capital can be derived in multiple ways, the most described of which is the weighted average cost of capital (WACC). The WACC is a firm's weighted costs of capital after taxes and consists of both the cost of debt and the cost of equity timed by the appropriate proportions of debt and equity to the total value of the firm (weighted).

$$WACC = \frac{E}{V} \times Re + \frac{D}{V} \times Rd\ (1 - Tc)$$

In which, Re = cost of equity, Rd = cost of debt, V = E + D = total market value of the firm's financing (equity and debt), E/V = percentage of financing that is equity, D/V = percentage of financing that is debt, and Tc = corporate tax rate

Before I more into depth regarding the WACC's components, there are some general approaches a practitioner can apply for the WACC derivation. A practitioner can choose to apply a constant or variable WACC. A constant WACC means that the valuator applies the same WACC over the full forecasting period in contrast to a variable WACC that is altered for changing capital structures. Literature describes that a variable WACC should be applied for firms that do not have a stable capital structure (yet), often SMEs or firms in highly dynamic industries or leveraged buyouts (LBO) (Vydržel and Soukupová (2012). In the study of Vydržel and Soukupová (2012) it was found that many practitioners used a constant WACC (i.e.). The private equity valuators in their sample more often chose for a constant WACC (69%) than the independent financial valuators (39%) and dependent financial valuators (38%), as in their believes "the recalculation of WACC would have only minor effects on the final value and thus does not repay the effort". The independent financial valuators most used a variable WACC (44%), some of them stated that it depends on the situation (22%). For dependent financial valuators, the constant WACC was just as likely to be used as a WACC depending on the situation (38%), the variable WACC was used by 25% of the sample.

A second general aspect of calculating the WACC is the assessment of debt and equity weights. Titman & Martin (2014) describe to make use of market values rather than book values where possible, as the market is best able to assess true values. However, privately held firms are as mentioned not listed on a public market. Vydržel and Soukupová (2012) find that 54% of the participants in their study used market values of equity and debt to assess the weights of the WACC. The market values of these privately held firms are in their study approximated by one of two methods, either by the book value of interest-bearing debt or all debt or by considering an industry average capital structure (peer). Apparently, practitioners do not have a clear preference for either market values or book values, where the theory clearly promotes the use of market values over book values.

2.2.1.1 Cost of Equity

The cost of equity is the return that investors demand for the risks that they bear by investing in the company. The cost of equity can be calculated in various ways; first of all via CAPM (Sharpe, 1964). Deriving the cost of equity via the CAPM approach is done via the following formula:

$$Re = Rf + \beta(Rm - Rf)$$

In which Re = Cost of Equity, Rf = Risk free rate, β the industry beta and Rm-Rf = equity risk premium

The variables in the CAPM formula cause the valuators to consider more options from which to derive their values. For the *Risk-free rate,* it is common to pick a governmental bond as these tend to hold virtually no risk, however the duration of the bond can vary. "The risk-free rate (Rf) is usually estimated by the current yield on the twenty-year US Treasury bonds" (Boudreaux et al., 2011: 94). Steiger (2010) however notes that professionals also use, even though the risk-free rate is actually the yield of T-bills or T-bonds, the London Interbank Offer Rates (LIBOR) as an approximation for the short-term risk-free interest rates. The next step when considering a risk-free rate based on a T-bill or T-bond of a different country is to consider a country premium if the valuated object is based in a different country, especially when valuing a firm in an emerging market. Damodaran (2019) finds that the country risk premium for the Netherlands is 0.00% as per January 2019. Vydržel and Soukupová (2012) included a country risk premium in their study on privately held firm valuation, which makes sense as the country risk premium of the Czech Republic in 2012 was 1.28% based on Damodaran's research.

As the country risk premium is equal to 0.00% in Netherlands it is expected that the risk-free rates are not based on the LIBOR or US treasury bonds but on the T-bills or T-bonds of the Dutch government.

"*The equity risk premium* reflects fundamental judgments we make about how much risk we see in an economy/market and what price we attach to that risk" (Damodaran, 2018). He continues by stating that the equity risk premium can be derived by (1) surveying subsets of investors and managers, (2) assessing the returns earned in the past on equities relative to riskless investments and use this historical premium as the expectation, (3) using implied premiums, that consists out of the estimated forward-looking premiums based on the market rates or prices on traded assets today. "To estimate the market risk premium (RPM), historical yields or ex post methods are commonly employed. Ibbotson Associates publishes historical risk premium data in its annual stocks, bonds bills and inflation. This is a source that is often used as the estimate for equity risk premium" (Boudreaux et al., 2011: 94). Damodaran (2019) calculated the equity (market) risk premium for the Netherlands as per January 2019 to be 5.96%.

Lastly, *Beta* is the coefficient that demonstrates the corresponding relationship in terms of the systematic risk between the expected return on equity of a levered and unlevered firm. (Yagill, 1982) "The most careful examination performed by Black, Jensen and Scholes shows that the relation between realized return and beta appears to be linear as predicted by the CAPM" (Solnik, 1974: 373) However, "if the company is not listed there is no data available to compute a linear regression. As a consequence, a peer group of similar companies is set up and the median of their unlevered betas is then relevered to fit the target's financing structure" (Steiger, 2010: 7-8). In prior studies professionals base their value for beta, besides peer groups, on fundamental drivers or experience. However, the most used method for assessing the beta is peer group based (Petersen et al., 2006; Steiger, 2010; Vydržel & Soukupová, 2012).

This beta especially forms the main problem for many critiques on the applicability of CAPM, especially the article of Fama and French (1992) caught a lot of attention because of their statements that tests do not support the most basic prediction of the SLB model, that average stock returns are positively related to market β's, and when the tests allow for variation in β that is unrelated to size, the relation between market β and average return is flat, even when β is the only explanatory variable, concluding that β does not seem to help explain the cross-section of average stock returns. Other research also find that, β not only fails to suffice in explaining average return, variables that (unlike size) do not seem to be correlated with β (such as earnings/price, cashflow/price, BE/ME, and past sales growth) add even more significantly to the explanation of average return provided by β. In both their papers Fama and French (FF) show the potential for their three-factor model, consisting of size (ME), growth potential (BE/ME) and the excess market return (Rm-Rf). Fernandez (2015: 2) adds to the serve critiques by stating that CAPM is an absurd model, as "CAPM is based on many unrealistic assumptions. It is true that 'all interesting models involve unrealistic simplifications' and CAPM has some assumptions that are convenient simplifications, but other assumptions (specially the homogeneous expectations) are obviously senseless. Furthermore, none of the CAPM predictions happens in our world". Using CAPM for a market according to Fernandez leads to errors and imprecisions, as "expected returns are determined not only by the beta and the expected market risk premium but also by other firm characteristics, the historical beta is a poor predictor of the expected beta, and due to the heterogeneity of expectations in cross-section returns, volatilities and covariance, and market returns". Besides the idea that 'a market-β does not exist', Fernandez points out that βs

for firms have a very wide and imprecise range of values for various time frames, indexes, and periods. He also shows how the beta estimates differ among different beta providers, such as “Yahoo Finance; Bloomberg; Damodaran Website; Value Line; Google finance; Reuters; DataStream; Morningstar; Barra; MSN” (Fernandez, 2009: 3)

Even though the strong critiques on CAPM, researchers found that over 70% of financial valuators recommend using CAPM, whilst other method receive much less attention (Graham & Harvey, 2001; Petersen et al., 2006; Vydržel & Soukupová, 2012; Welch, 2008). Graham and Harvey (2001) also find that larger firms are much more likely to apply CAPM than small firms with 3.27 versus 2.49. Da, Guo, and Jagannathan (2012) note that the Sharpe (1964) and Lintner (1965) capital asset pricing model (CAPM) is the workhorse of finance for estimating the cost of capital for project selection. Whatever the criticism in the academic literature, it continues to be the preferred model in managerial finance courses, and managers continue to use it. In their study they analyse the applicability of CAPM for project cost of capital calculations in making capital budgeting decisions, and find that a firm’s embedded real option to modify and abandon established projects and undertake new projects could be an important reason behind the poor performance of the CAPM in explaining the cross section of returns on size- and book-to-market-sorted stock portfolios. They also find that CAPM provides a reasonable estimate of a project’s cost of capital, provided that any embedded real options associated with the project are evaluated separately for capital budgeting purposes. Boudreaux et al. (2011) point out that for public firms’ financial transactions are required to be disclosed as public information, whereas closely held firms are under no such obligation. Thus, derivation of an appropriate cost of capital measure is much more difficult for closely held firms than for publicly traded firms. Next to all the critiques beta received in the aforementioned, as the stock of closely held firms is not listed, it is very difficult to even calculate a beta. This forms an extra risk for using CAPM for closely held firms.

Another method to determine the cost of equity, which allows for flexibility and qualitative discussion, is the build-up model. In this method the cost of equity is broken down into components and allows for company specific risks to be included explicitly in the cost of equity. The general formula that is used is the following:

$$K_e = R_f + R_m + R_s + R_u + R_c + O$$

In which, Ke = expected equity return or cost of equity capital, Rf = risk-free rate, Rm = market risk premium, Rs = size premium, Rpu = unsystematic risk premium, Rc = country risk premium (international investing, disregarded in this study as it is focused on the Netherland), and O = other adjustments.

The risk-free rate (Rf) and market risk premium (Rm) can be derived similarly as an investor would when using CAPM, however the derivation of the size premium has not previously been discussed. The size premium is in place to capture the higher risk and therefore higher expected returns for smaller firms, due to less borrowing power, more default risk, more volatility, high opportunity costs and a less proven track record. Boudreaux et al. (2011: 94) state about this premium that “there are no adequate empirical studies to quantify this higher cost for small non-publicly traded firms and sometimes the yields inverse, resulting in smaller firms having lower yields than larger firms. This causes theoretical conflicts. Accordingly, the premium is mostly a subjective assignment based on an expert's experience and personal observations.” The specific risk of a firm (unsystematic risk) (Ru) accounts for the industry risk, volatility and dependencies on key drivers in the value chain (e.g. suppliers, customers, management, employees), also for example a higher risk on lawsuits can be

taken into consideration in the specific risk factor. The specific risk factor is rather situation-sensitive and usually up for discussion.

The advantages of this approach are mainly; its ease to use, clarity and logic conceptualization for non-experts in valuation. Furthermore, by simply adding components that can be reliably estimated, the building block method (build-up method) avoids estimation problems that often lead to problematic values for the expected returns to individual securities. In particular, the approach avoids estimation of factors and factor exposures as in CAPM or Arbitrage pricing theory (APT). Pratt (2009) describes various entity level discounts that could be implemented in a build-up method cost of equity approach. He describes (1) discount for trapped-in capital gains, meaning that much of the capital investments are stuck in assets that are not easily transferrable to capital gains, (2) a key person discount, meaning that if specific individuals were to leave the firm it would lose (much of its) value due to specific knowledge, capabilities or a personal network, (3) a discount for known or potential environmental liability, which aims at potential environmental clean-up costs due to environmental disturbances, (4) discount for pending litigation costs, (5) heterogeneous asset discounts, indicating a poor diversified asset base that might be harder to sell at liquidity, (6) a concentration of the customer or supplier base, that brings risks in prices negotiations.

2.2.1.2 Cost of Debt

The cost of debt financing for a closely held firm is usually higher than for a comparable publicly held firm. Closely held firms generally must rely on trade credit and loans or lines of credit from owners and financial institutions such as commercial banks, whereas publicly traded companies may issue more cost-effective corporate bonds as well. Even though debt costs are generally higher for the small closely held firm, these costs can be estimated by reviewing the firm's loan interest rates and its marginal tax rate. If the firm has historically been granted loans at prime, then its current rate at the margin is the present prime rate (Boudreaux et al., 2011: 93). To derive the cost of debt, four methods are mentioned in prior literature; (1) via the firm's book value, (2) effective interest rate based on its yield to maturity (YTM), (3) an industry average, (4) a synthetic bond rating. (Titman & Martin, 2014: 62-65)

In the research of Vydržel and Soukupová (2012), the cost of debt was most often derived by the current effective interest rate (48%), followed by the book loan rate (40%), an industry average (29%), a synthetic rating (14%) and lastly, via another way (not further explained) (12%). The sample was able to select more than one method, thereby allowing the sum of the percentages to be higher than 100%. Petersen et al. (2006) found that the cost of debt was determined by 75.8% of the sample of valuators based on the effective interest rate (from the transaction), 24.2% uses a synthetic rating, 15.2% an industry average, whilst only 3% used the book value of debt. In their sample all private equity valuators (11 persons) used the effective interest rate, whilst 1 also used a synthetic rating (9.1% of the sub sample). Independent valuators were less inclined with the effective interest rate (90.9%), however especially the dependent valuators made use of different approaches next to the effective interest rate. Whilst this was still the preferred method with 63.6%, the synthetic rating followed closely with 54.5% of the sample using this method to derive the cost of debt.

2.2.1.3 Corporate tax rate

When determining the tax rate that should be used in calculating the cost of capital the choice is between the effective and the marginal tax rate. The corporate tax rate in the Netherlands is

dependent on the taxable amount of a firm. The taxable amount is the taxable profit in a year less the deductible loss. If the taxable amount is less than €200,000, the tax rate is 20%. If the taxable amount is €200,000 or higher the corporate tax rate is 25%. Damodaran (2012) notes that the most widely reported tax rate is the effective tax rate, which is computed by dividing the 'taxes due' by the taxable income of a firm. The marginal tax rate is the tax rate the firm faces on its last dollar of income. Damodaran (2012) estimates the marginal tax rate to be far safer when predicting future cash flows because the effective tax rate is really a reflection of the difference between the accounting and the tax books, thereby not reflecting fundamental value differences but merely accounting technicality differences. By taking the marginal tax rate a valuation can be skewed, as a firm might have a capital structure in which it has significantly fewer tax obligations (e.g. due to different accounting standards, depreciation methods or deferred taxes). However, an advantage of the marginal tax rate is observable when the valuation period the same tax rate should be used to prevent volatility. Also, in perpetuity the effects of different depreciation methods or deferring taxes, that would be considered when one considers the effective corporate tax rate, cannot be sustained. By using the marginal tax rate, one tends to understate the after-tax operating income in the earlier years, but the after-tax operating income is more accurate in later years. If one chooses the effective tax rate one should modify this rate to the marginal tax rate over time, thereby also creating a variable cost of capital.

2.2.2 Terminal Value

The next component of the DCF method is the terminal value of the firm calculated back to the present value. "The terminal value often accounts for 60–80% in a DCF-valuation and should capture the major parts of value creation" (Petersen et al., 2006: 40). Vydržel and Soukupová (2012) mention four methods for calculating the terminal value of a firm, a fifth option is *other methods*. The four mentioned are (1) Gordon growth model, (2) multiples, (3) value driver model, and (4) the convergence model.

The Gordon growth model is used the most in both studies of Vydržel and Soukupová (2012) and Petersen et al. (2006), with 67% of the respondents and 80%, respectively. The Gordon growth model relies on a constant terminal growth rate of the future cashflows after the explicit forecast period.

$$TV = \frac{FCF(\text{Last year}) * (1+\text{g})}{(r-g)}$$

The core multiple in the multiples-based approach for calculating the terminal value of a firm is based on EBITDA (EV/EBITDA), whilst also EBIT (EV/EBIT) is used by 31% of participants who use multiples. Other industry-specific multiples are known to be used as well, such as EV/NCE (enterprise value/noncash expenses) or the rarely used EV/PAT (enterprise value/profit after-taxes) (Vydržel & Soukupová, 2012: 94). In the researches of Vydržel and Soukupová (2012) and Petersen et al. (2006) 64.4% and 14.3% of their sample used multiples-based terminal valuation.

The value driver model is first mentioned in the works of Koller et al. (2010) and is derived from the Gordon growth model. It focuses, however, on the return on invested capital (ROIC), which is the ratio to assess a company's efficiency in allocating capital in their investment portfolio. In Petersen et al. (2006) this method is used by 14% of the sample, while only 4% of the sample of Vydržel and Soukupová (2012) stated to use this method for determining the terminal value.

$$TV = \frac{Invested\ Capital \times ROIC\ \times (1 - \frac{g}{ROIC})}{r - g}$$

The convergence model is applied when it is assumed that ROIC is equal to the cost of equity in the value driver model, according to Petersen et al. (2006). The principle of the convergence model is that growth does not contribute to firm value, as it is assumed that no firm can outperform the industry infinitively but will in the long-run regress to the industry mean. Damodaran (1996: 193) argues that "in practical terms, the stable growth rate cannot be larger than the nominal growth rate in the economy in which the firm operates". In the study of Petersen et al. (2006) this model was only used by few, Vydržel and Soukupová (2012) found 11% of Czech valuators used this model.

$$\mathrm{TV} = \frac{NOPAT}{r}$$

In both Vydržel and Soukupová (2012) and Petersen et al. (2006) the main terminal value determination method was found to be the Gordon's Growth Model (67% and 80%), where in the research of the Czech valuators the multiples-based method was also quite often used (64%) Petersen found the other methods to be only used at most by 17.1% of the respondents (Convergence model).

Damodaran (2012: 306) states that "using multiples to estimate terminal value, when those multiples are estimated from comparable firms, results in a dangerous mix of relative and discounted cash flow valuation. While there are advantages to relative valuation, a discounted cash flow valuation should provide you with an estimate of intrinsic value, not relative value. Consequently, the only consistent way of estimating terminal value in a discounted cash flow model to use either a liquidation value or stable growth model". It is therefore assumed that the Gordon Growth model is used most in terminal value estimation

When considering either the Gordon growth model or the value driver approach, one has to determine a terminal growth rate. The Gordon growth model assumes a constant growth rate 'g', keeping in mind the 'regression to the mean' theory one would expect that no firm can outperform the market indefinitely, thereby making the market growth (i.e. proxy is the national GDP) a fair terminal growth rate. However, a firm that has been growing with 20% in the last 5 years is not expected to grow in the future with only approximately 2-3% as the GDP would. One could then consider having multiple periods where the growth is first above-average (i.e. supernormal), then a period of average growth (transition) and then sub-average growth (equilibrium).

2.2.3 Forecasting Period

Koller et al. (2010) recommend a forecast period of 10 to 15 years and even longer for firms that seem to have high growth rates and therefore need more time to reach a mature stage. "Using a short explicit forecast period, such as five years, typically results in a significant undervaluation of a company or require heroic long-term growth assumptions in the continuing value." An explicit forecast period longer than 15 years makes it in turn difficult to predict individual cash flows. Their solution is to split-up the sample in a detailed forecast for 5 to 7 years and a simplified forecast for the following years in the chosen explicit forecast period.

In the research of both Vydržel and Soukupová (2012) and Petersen et al. (2006) it became apparent that most practitioners use forecasting period ranging from 1 to 5 and 6 to 8 years in their valuations.

This would thus be against the advice of Koller et al. (2010). This is most likely simply because of a lack of data on the forecasted future cashflows. The inherent uncertainty of future outcomes forces valuators and fund managers to adopt a short forecast horizon, and to rely on the subjective estimation of terminal value (Barker, 1999). Block (1999) even found a shorter horizon was used by his respondents. He observed that few analysts project earnings or dividends more than two (or at most three) years into the future because of uncertainty. Seemingly contradictory, he also found that 292 of the 297 surveyed analysts put more weight on the long-term outlook than on the current quarterly earnings.

Pinto et al. (2019) find that based on 1,048 responses, their CFA member respondents used individually forecasted cash flows with a mean of 7.77 years and a median of 5 years. I expect that the Dutch sample of Registered Valuators uses a similar timeframe.

2.2.4 Adjustments

Pratt (2009) theoretically describes an entity level discount but also shareholder characteristics discounts of ownership. He tries to define a base to which these discounts or premiums are applied. He defines two premiums: a control value and a minority marketable value (also sometimes called 'publicly traded equivalent value' or 'stock market value'). The degree of ownership control reaches from full control with 100% of the shares in a portfolio to a tiny minority share that bears no control attributes at all. In privately held firms the level of control often is transferred for the full 100 percent, indicating that if based on market multiples that trade minority shares, a premium should be added to the comparative value. Also the degree of marketability can span a wide spectrum, as it can range from an active public trading company from which shares trade instantly to one that does to trade at all with severe restrictions on any attempt to sell. Although in practice both marketability and illiquidity are used interchangeably regarding this specific discount, they are factually defined differently; liquidity relates to the speed with which an asset may be converted to cash without diminishing its value, whereas marketability relates to the right to sell something (Pratt, 2009).

The discount of control is applied when a buyer does not get full control over a firm, a premium might be applied if the buyer does get full control. Damodaran (2012: 488-503) states that "the value of controlling a firm derives from the fact that you believe that you or someone else would operate the firm differently (and better) from the way it is operated currently". The expected value of control is the product of the probability that change occurs and the effect that the change has on the value of the firm. The probability of the change occurring is equal to 1 if the acquisition is successful. Damodaran mentions four approaches to enhance the value of a firm after gaining control: (1) increase cash flows, (2) increase expected growth rate, (3) extend high growth period, (4) reduce cost of capital. The estimation of this premium is therefore suggested to be case-specific, as not everyone can generate as much increased funds or decreased costs for each firm. Damodaran proposes 4 propositions, the first states that "the value of control is not 20%", meaning that there is no simple rule of thumb, every control premium is highly case specific, and can be zero if controlling the firm does not make it more optimally run. Proposition 2 is that "to make the control premium real, you have to act on it", meaning that only if changes are actually put through value is created. Proposition 3 reads "whether you add a control premium to a valuation will depend on how the valuation is done", meaning that if the firm is already valued as an optimally run firm rather than the actual practices, there is no reason to add a control premium. Only if real changes, that can be put through by a controlling stake, can create value. Examples of optimally valuing a firm are using target capital

structures, industry average margins or optimistic growth numbers. A control premium added to this, is overestimating control value. The last proposition is related to the premiums in public firms, and not related to the topic of this thesis. “The value of control in a firm should lie in being able to run that firm differently and better. Consequently, the value of control should be greater in poorly performing firms, where the primary reason for the poor performance is the management.”

Other premiums could include voting versus nonvoting stock and blockage premium, which is an amount so large that it would depress the price if put on the market all at once, but these are both normally applied only to publicly traded stocks. “The degree of control is usually considered before the degree of marketability because, although control and marketability are separate issues, the degree of control or lack of it has a bearing on both the size of the discount for lack of marketability and the procedures that are appropriate to quantify the discount for lack of marketability” (Pratt, 2009: 5).

Petersen et al. (2006) found based on interviews with corporate financial advisors and private equity funds that for privately held firms indeed these two adjustments are commonly made in calculating the WACC for privately held firms (i.e. illiquidity/marketability and a control premium). For these premiums they calculated the average, median and standard deviation described by the practitioners from their sample. The average illiquidity/marketability discount they found was 31.3%, and their control premium (i.e. if an investor can gain control over the firm and gain synergies from that) turned out to be 29.4% on average. Adams and Thornton (2009) found that “after controlling for other explanatory variables, the results indicate a statistically and economic significant private company discount of approximately 30 - 40%”. This private company discount is a combination of both control and marketability premium. These percentages are in line with empirical data Pratt (2009) found based on court cases in the US.

Next to the entity level discounts, another adjustment that can be made by valuators is the small capitalization discount (small cap). This is adjustment is sometimes made on an entity level and other times included in the discount rate. Empirically, Vydržel and Soukupová (2012) found that about 50% does not use a small cap premium, however of those who do use a small cap premium they find that most use a discount in the range of 1-3% (29%). More than 5% was applied by 17% of their sample. They applied a Fisher Exact test and found that the sub-groups (PE, financial advisors dependent and financial advisors) have strong differences of opinion regarding the small cap premium. 73% of PE valuators do not use a small cap premium, whereas only 26% of independent financial advisors applies no small cap premium. The independent financial advisors are also more likely to apply more than 5% (21%), as opposed to PE (13%). Dependent financial advisors are between the two and tend to apply 3-5% small cap premium. From the theoretical perspective, Damodaran (2016) estimates the average US equity small cap discount to be 3.82% between 1926 and 2015, indicating the outperformance of small cap stocks compared to large stock, resulting in higher demanded return on equity. The observed standard error is 1.91%, which makes pinpointing the exact small cap premium very difficult with any traditional level of confidence.

Imam et al. (2008) also found that some of the valuators are allowing their own subjective judgement to over-ride the conclusions of any given valuation model. This is also built on the first findings of Barker (1999: 214) on the differences between the theory and common practice. He concludes “beyond this first screen, the valuator or fund manager explores mostly subjective, company-specific

information, including dynamic contracting; and such information is not then formally fed back into a valuation model, such as the DDM. In other words, valuation models – and, in particular, the dividend yield and the PE ratio – are used as a point of departure, as a basis from which to conduct fundamental analysis and to make investment decisions. They are not used exclusively, in themselves, to value shares." Vydržel and Soukupová (2012) also find that 61% of their sample adjust multiples for various factors such as size, liquidity, control (majority share) and comparability with prior transactions. According to Pinto et al. (2019), the added premiums in valuations are not standardised measures, and require some trade-off regarding either situation-specific or personally preferred additions or alterations.

2.3 Factors in valuation method choice

This section shines a light on the prior literature regarding the question: '*What factors affect which valuation model valuators choose?*'. I test whether the use of the two most used valuation methods (DCF and multiples) is affected by effects from three perspectives. These are: (1) the valuator perspective, (2) the valued firm perspective and (3) the purpose of valuation. For the valuator perspective, literature has found that valuators have preferred methods that are driven by personal characteristics. As contrast, Pinto et al. (2019) recently find that the personal characteristics of valuators have no effect on the models that they select for their valuations. I extend the items of this factor and include this factor mostly as control variables in the regression. The valued firm perspective is measured as the level of asymmetric information in the valuation. Chaney & Lewis (1995) find that firms with high level of asymmetric information compared to their investors tend to smooth their earnings, thereby preventing the usability of multi-period approaches. Lastly the purpose of valuation is covered in the level of client orientation in valuations. Imam et al. (2008) find that valuators tend to use the DCF approach more when they represent the sell-side of a transaction, because this leads to a more fundamental approach and intuitive story. Contrarily, participants of their study mentioned to use earnings multiples as their final valuation models as these are easier to understand for their clients. In the model below the constructs and the dependent variable are depicted. In the following the individual constructs are further explained. These constructs are expected to be captured by the role the valuator has, being a private equity valuator, financial advisor focused on listed or unlisted firms.

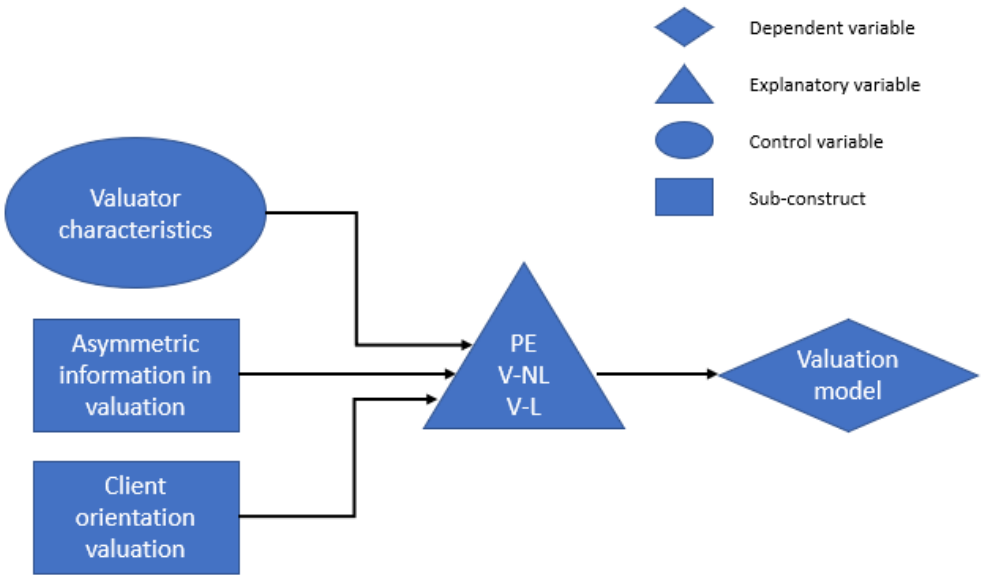


Figure 1: Construct overview

2.3.1 Valuator characteristics (Control)

The implementation and interpretation of different methods requires different amounts of skill and knowledge from the investors. Multiples are less time consuming to calculate and easier to understand. Applying DCF models appropriately requires more in-depth knowledge. This point is acknowledged by Imam et al. (2008), who concluded that the continued use of valuation multiples is due to the difficulty in the technical applicability of the DCF method and the need for excessive (financial) information. Part of the inputs needed are forecasts for the future cash flows, which are difficult to obtain, and often requested from the valued firm themselves (Petersen et al., 2006). Barker (1999) too describes the problem of the inherent uncertainty of forecasted data, as these 'sophisticated' models, such as DCF, are of limited use if only a reliable forecast of two years can be produced. Forecasting is difficult task that can be too repellent for valuators that have not finished a financial education. Seemingly contrary, Block (1999: 87-92) finds that only 15.2% of his sample of financial analysts always uses a present value technique. According to him this does not mean an indictment of the profession, but it does show that "the task of projecting earnings, dividends … and determining an appropriate discount rate may be too fraught with uncertainty for analysts to rely on discounted cash flow (DCF) analysis in the determination of value" (p.87). Furthermore, Block finds that non-MBAs use the DCF approach more often in all their valuations that MBA holding valuators (i.e. 20.4% versus 10.6%, respectively). However, these results were not significant on the basis of a chi-square independence of classification test. This shows that a higher academic degree earned does not necessarily mean that the DCF is more and better implemented. However having earned a financial degree (i.e. CFA charter) does significantly increase the use of the DCF approach.

Besides education, Block (1999) finds evidence the experience causes the analysts to be less affected by the 'hype of the moment' as his experienced respondents puts least weight on the next period's earnings per share (EPS) in determining buy-, hold- and sell decisions and more on long-term outlook and changes in trading ranges, thereby being less easily swayed to use different valuation approaches. Intuitively, it can be expected that (private equity) valuators that have more experience assessing the realistically realizable future returns that targets can generate, may have a better feel for the 'fair value' of a transaction. Their advanced knowledge of the market or perceived advanced knowledge of the market may lead them to using multiples valuation rather than the more time-consuming DCF approach. It might however also be that if the valuator is less experienced, that they may have newer insights regarding the use of DCF and multiples, as well as to other methods compared to their more experienced co-workers.

The firm for which a valuator works can have an effect on the valuation method selection, as a firm can have a standardized valuation approach. These restrictions are expected to be more often noticeable for valuators that are working in larger firms, as larger firms tend to have more standardized processes than smaller or younger firms. Listed firms are usually larger than non-listed firms. From this perspective, it is assumed that valuators that mostly value listed firms are more restricted by their firms in selecting a valuation approach than valuators that value mostly non-listed firms or private equity valuators. It is therefore expected that listed firm focused valuators are more likely to mention a valuation method that they (nearly) always use, compared to non-listed firm focused valuators.

Mukhlynina and Nyborg (2018: 1) tested valuation techniques against their educational and professional relevance. They found evidence in their international sample for the "sociological

hypothesis", where 'profession matters more than education; different professions have different valuation cultures. Thus, in practice, the values attached to different firms and projects and, ultimately, resource allocation may depend on "where" the valuation is carried out'. They tested for education, experience, and valuation purpose. I test for spurious relations between variables and consider more constructs and, ultimately, variables, but their findings depict the relevance of personal and professional characteristics.

2.3.2 Asymmetric information

Pinto et al. (2019) find that ownership structure, size, reporting quality and growth matter most in valuation method selection. Information asymmetry can be linked to all these components and therefore as the overarching construct. Stowe, Robinson, Pinto and McLeavey (2007: 22) note that "the availability and quality of data are limiting factors in making forecasts and sometimes in using specific financial performance measures. As a result, data availability and quality also bear on our choice of valuation model". Another criterion for model selection should be consistency with the characteristics of the company being valued, as the understanding of the business is the first step in the valuation process. As an example it is stated that for a bank, that is composed largely of marketable assets and securities, a relative valuation based on assets has more relevance than a similar exercise for a service company with few marketable assets. I note that this difference in asset-base also can be scaled back to an information asymmetry issue, as a rather tangible asset-base can be better valued in detail (e.g. using a DCF approach) than one that is more intangible in its nature, thereby more relying on a relative valuation approach. Therefore, if information availability issues are high it is expected that a relative valuation is preferred, whereas if information asymmetry is low a DCF approach is favoured.

From another perspective, if a firm faces less information asymmetry its comparability is higher, meaning that a relative valuation approach could indeed be favoured. This idea is supported by the results of Demirakos et al. (2004), who conclude from their content analysis study that analysts appear to tailor their valuation methodologies to the circumstances of the industry. They find that in the electronics and pharmaceuticals sectors analysts prefer a multiperiod valuation model whereas in a sector that is more stable, in this case the beverages industry, a single-period method of comparatives is more likely to be dominant (i.e. multiples valuation). They argue that this is the case because conventional accounting does a better job of capturing the value of the firm in stable industries. This is later also concluded by Imam et al. (2008: 531), who find that in the industry of higher growth technology and media stocks DCF was applied significantly more often than other valuation approaches. They argue that this is because specifically this higher growth for which in DCF a valuator can include a multistage with time-varying growth rate assumptions. This might indicate that a valuation in which there is a high level of information asymmetry (e.g. volatile industry growth), there is a need for a more explicit exploration into the valued firm as comparables values might not be sufficiently transferrable to the valued firm. Lie and Lie (2002) also find supporting evidence for the idea of a preferred DCF approach where information asymmetry is high as they found that "the accuracy and bias of value estimates, as well as the relative performance of the multiples (measured as estimation error of past valuations), vary greatly by company size, company profitability and the extent of intangible value in the company.

Pinto et al. (2019) find in their survey results that equity analysts with private clients tend to use the present discounted value approach less frequently than analysts with institutional clients. For

privately held firms for which analysts did use a present discounted value approach there was a stronger preference for dividend discount models than for their public counter parts. As mentioned before, privately held firms have no obligations to publish their financial data to the extent of the public counterparts, this creates an information asymmetry for the valuators if they are unable to access this financial data through the firm itself. The findings of Pinto et al. (2019) seem to suggest that indeed information asymmetry does lead to a more general or basic approach such as enterprise level relative valuation models, rather than a detail oriented DCF approach.

Firm size as well as reporting quality might play a role in the issue of selecting a valuation model, Binks and Ennew (1996) report evidence where small businesses face restricted access to finance primarily as a consequence of information asymmetries. They conclude that "the availability and cost of finance is one of the factors which affects the ability of a business to grow" (p: 1), next to growth issues these information asymmetries as argued before might lead to valuation method selection issues. Such information problems are not unique to the small firms' sector but are considerably more prevalent there because of the anticipated higher costs of information collection. Fosu, Danso, Ahmad and Coffie (2016) found that information asymmetry is negatively related to firm value and that firms with low growth opportunities this firm value is less sensitive to information asymmetry, supporting the idea that valuations of firms in high growth industries should more often affected by information asymmetries in their selection process.

Previously, in the asset-based approach (see 2.1.3.) I noted that the choice whether a valuation is made on a going-concern basis or liquidation basis should matter in valuation model selection, as a firm facing bankruptcy is more realistically valued using an asset-based approach, such as the sum of all book values (i.e. Sum Of the Parts, 'SOP'). One of the largest challenges in a valuation is forecasting future revenues, cash flows or profits. This process is also a very subjective one in its nature. Disregarding this phase by considering a liquidation basis as premise of the valuation, this decreases the information asymmetry in a valuation tremendously. Thereby, a decrease in information asymmetry might also mean that the asset-based approaches are preferred by valuators.

To summarise, the items that are collectively forming the *information asymmetry* construct are the 5-point Likert importance assigned to: target firm industry, annual growth, financial reporting quality, firm size, ownership structure, tangibility of the assets and a directly asked observed information asymmetry towards the valuation object.

Considering that various parties face different amounts of information asymmetries, it is expected that financial advisors who mostly value small privately held firms face the most information asymmetry, especially those at the buy-side. Financial advisors who mostly value listed firms are expected to face less information asymmetry as public firms are usually better in their financial reporting, as are larger firms. However, private equity valuators can be expected to face least information asymmetry due to their connection to the firm that they buy into, as well as their relatively short valuation and investment period. From the other side, the firms where private equity valuators buy into are typically undervalued growth firms with volatile earnings in opaque markets, hence as a proxy the level of information asymmetry a respondent believes to face in their valuations is questioned on a 5-point Likert scale.

2.3.3 Client orientation

Stowe, Robinson, Pinto and McLeavey (2007: p.23) note that "related to purpose, the analyst is frequently a consumer as well as a producer of valuations and research reports. Analysts must consider potential biases when reading reports prepared by others … the purpose or perspective of the analyst—for example, the ownership perspective—can also influence the choice of valuation approach". More intuitively, with these different goals one can expect the use of different sub-components too, for example, private equity usually buys into stock for a relatively short time in which they change parts of the business to generate quick value. A shorter forecasting period could therefore be more applicable than for a financial advisor that values the firm on a going concern basis for future potential if the firm continues to operate and grow as is. Private equity analysts also only need to report internally, as they themselves invest in a firm. Financial advisors have a client for whom they value, this can be both transactional related or non-transactional related and both on the buy- or sell-side. Financial advisors therefore can be expected to need more tools to fulfil all goals sufficiently. Next to sufficient tools to derive a proper value, they are also responsible for bringing across this value as the true value to their clients, a more detailed DCF could then be more informative, however a multiple might be more intuitive for a non-financial client. This idea, where financial advisors rely more on the intuitiveness of the valuation and therefore more often than not choose the DCF a primary valuation tool, is supported by the studies of Pinto et al. (2019) and Imam et al. (2008).

Pinto et al. (2019) find significant differences between the valuation methods used by buy-side investment analysts, sell-side investment analysts and portfolio managers. Portfolio managers use the present discounted value approach less than the other two and sell-side analysts use less information from external vendors, which could be evidence of the information asymmetry idea in valuations. Pinto et al. (2019) find that valuators who work for different employers (i.e. brokerage firms, hedge funds, investment banks or investment management firms) have significant differences in their valuation methodology. Imam et al. (2008: 531) find in a series of interviews strong evidence that analysts' valuation model selection is client driven, particularly in the light of the strong preference of buy-side analysts for DCF.

Demirakos et al. (2004) observed that of their sample group of investment banks who constructed both multiperiod valuation models (DCF) and single-period comparative models (multiples) only half deemed their multiperiod model as dominant in their final value determination. If speed and comprehensibility are factors in deciding on which method to use, multiples could be preferred more by those who only need to value for themselves (i.e. private equity valuators), rather than for those who also need an intuitive story towards their clients (i.e. financial advisors).

To summarise, the items that make up the *client orientation* construct are transaction-relatedness, buy- or sell-side, intuition of the story towards the client, purpose of the valuation and client understanding of the valuation. I hypothesize based on prior literature that client orientation is positively related to the use of the DCF methodology and negatively to the use of relative valuation approaches. Private equity valuators are expected due to the least amount of client orientation to use a multiple approach.

2.3.4 Regression model

Estimating the effects of the aforementioned factors is done by using a logistic regression, where the dependent variable is a dummy, that takes a value of 1 if the method is used and a value of 0,

otherwise. In a second part I analyse some sub-components that are significantly differently estimated by the sub-groups and are therefore of interest. These are analysed using the multinomial logistic regression (MNL), which is in accordance with the research of Brounen, De Jong and Koedijk (2006). They however conducted an ordered logistic regression based on a 5-point Likert scale as their dependent variable was an ordinal one.

The multinomial logistic regression is an extension on the logistic regression models that focuses on dichotomous or binary outcomes, in the sense that it can predict from more than two values for the dependent variable based on a set of covariates (Hosmer, Lemeshow, Sturdivant, 2013). In the financial literature it is also known as the discrete choice model or conditional logit model as described by McFadden (1984). Where the MNL is easy to compute and to interpret as it is similar to other ordinary logit models, it has a restrictive pattern of inter-alternative substitutions as it relies on the independence from irrelevant alternatives (IIA) property.

Summarizing the independent variables in the logistic regression models. There are three sub-constructs, (1) the valuator's characteristics (age, financial graduate degree and experience with the market), (2) the valued firm's characteristics (size, industry, growth and financial reporting quality), measured as information asymmetry and (3) the purpose of valuation, which is measured as client orientation. The independent variables are all set up as attributes of the valuator, as recommended by McFadden (1984). Therefore the impact of industry growth is written as a characteristic of the valuator, meaning that it is asked in the survey as a mode of importance, such as 'To what extent are the following characteristics of the industry of importance in selecting a valuation method' measured on a 5-point Likert scale.

The main construct however is expected to be type of valuator, meaning the role of the valuator (private equity versus (non-)listed firm focused valuators). This assumption is made on the premise that all these groups face distinct levels of the sub-constructs mentioned priorly. The assumption is tested using principal axis factoring. The strength of the constructs and their items is tested using Cronbach's alpha, as widely described in 3.2 'Factor analysis'.

3. Research methods

Currently there is no database that provides an overview on the valuation methods applied in the Netherlands by different groups of valuations. Therefore, I conduct a survey-based research using three research questions:

1. *What valuation models are used by valuators in valuations of privately held firms in the Netherlands?*
2. *How are these models applied?*
3. *What factors affect valuation model selection?*

I have set up an inductive exploratory research design using a cross-sectional survey that combines quantitative and qualitative questions following a common strand of financial literature, best depicted by the studies of Dukes et al. (1996), Block (1999), Graham and Harvey (2001), Bancel and Mittoo (2004), Brounen, De Jong and Koedijk (2006). The sample spans 560 valuators (234 private equity valuators and 326 financial analysts). The second research questions follows Imam et al. (2008: p. 507) and delves into why particular components of specific valuation models are preferred. The third part is a multivariate regression using logistic- and a multinomial logistic regression (MNL). For this MNL I create 3 sub-constructs and combine this in one main construct using exploratory factor analysis (EFA). The sub-constructs are: Information asymmetry, client orientation and valuator characteristics, where the valuator characteristics are considered a priori as a controlling construct. The main construct is the type of valuator, as this is expected to capture the effect of the sub-constructs. This research methodology section describes the execution of this study, the rationale behind the application of the prescribed procedures as well as the methods that are necessary to identify, select, process, and analyse the data. This section provides the replicability of the study as well as assessment of the validity and the reliability of the research design. The structure of this research methodology follows that of the three research questions, for these research questions we describe their hypotheses, their respective variables, and the measurements. Due to the similar nature of the first and second research question, be it that the second research questions goes into more depth, their variables, hypotheses, and method are described together. Thereafter, the factor analysis of this thesis is described, which provides support for the theoretical basis of constructs for the (multinomial) logit regression that answers research questions 3.

3.1 Valuation method and DCF-component selection

3.1.1 Hypotheses

Dooley (2009: 58-65) describes how constructs are usually not directly observable or at least not as accurate as demanded. He also explains how in inductive exploratory research, the researcher concocts general principles or relationships that might explain specific observations, anecdotes, or research results. These thought of and visualized relationships are tested using operationalized definitions regarding the variables, or hypotheses. In appendix B (i.e. 'Hypothesis list') I present an overview with all hypotheses that are derived from literature and have an effect in the valuation process of privately held firms.

The first four hypotheses (on general use of valuation methods) are described in section 2.1 of the literature review, 'valuation methods', and relate to the first research question. The second research questions builds upon hypotheses 3 and 4, whilst extending this with hypotheses regarding sub-

components of the DCF and multiples approaches, as well as how the final values are adjusted and presented. Literature regarding the DCF implementation can be found in sub-section 2.2 'DCF components'.

3.1.2 Variables

The first and second research question are answered using hypotheses that are aimed at finding differences between independent sample groups (i.e. financial advisors of listed- and unlisted firms and private equity valuators) regarding their usage rates of valuation methods. I have asked a multiple-choice question where respondents can fill out all methods that they use in their daily valuations. This results in an answer where various numbers are listed together (e.g. methods 1, 3, 5). To make these variables usable I created dummy variables for all approaches, that indicate '1' if the method is used by this respondent, and '0' otherwise. The number of users of each method are counted and divided by the total amount of respondents.

3.1.3 Methodology

3.1.3.1 Valuation methods

To analyse the ordinally scaled variables, Barker (1999a) uses the Wilcoxon test. This test allows for ranking the outcomes of the deemed importance of the valuation methods based on their respective means, hence it allows for finding the most used approaches as well as the least used approaches, whilst also testing these for significance. Barker (1999a) however does not test for differences among the sub-groups. Brounen, Koedijk and De Jong (2006) do not use the Wilcoxon test, but only use a multivariate regression, namely the ordered logit regression. The measurement level of the 5-point Likert scale items are ordinal as the differences between the items are non-measurable.

I combine both analyses in this thesis, I sketch a general picture regarding the practices that are applied in valuations in the Netherlands by comparing adoption rates. To compare these variables adoption rates, for example that of the DCF approach, I two-sidedly test the adoption rates of the individual methods, by using one-sample t-tests with *mu* set to the adoption rate of DCF. This approach of setting up an explorative questionnaire regarding business valuation deviates from the proposed measurement idea by prior studies of Barker (1999a), Brounen, Koedijk and De Jong (2006) and Imam et al. (2008). The advantage of my approach is that it is not asking for a subjective importance based on beliefs alone but highlights the real-world differences in the usage of valuation methods in valuations. To highlight the differences between the sub-groups I conduct analyses of variance (ANOVAs) that test for differences in means. I highlight these differences by a post-test, the TukeyHSD. This test shows how the means of the three sub-groups compare to each other and whether their differences differ significantly. This has the advantage over the ANOVA that I can observe where the significant differences in the model come from on a sub-group level, rather than trusting the F-test statistic of the model alone. As I have more than two sub-groups (private valuators, public valuators, and PE), I use ANOVAs to compare the means across groups for numerical variables such as 5-point Likert scaled variables.

For categorical variables I use Fisher's exact test of independence and a chi square test with simulated p-values based on margins using Monte Carlo simulations, which both test for frequency differences between sub-samples. Due to the small sample size, simulated p-values are needed. This implementation of the Fisher's exact test follows common literature regarding the categorical statistical literature of McCrum-Gardner (2008) & Bower (2003).

3.2 Factor analysis

3.2.1 Explorative factor analysis

As described in literature section 2.3, the sub-constructs or second-order constructs are formed on a theoretical basis and based on the outcomes of empirical research of prior studies. However, to provide more support and a sound scientific reasoning I formally identify these 3 constructs by using explorative factor analysis (EFA).

Before running any factor analysis, Dziuban and Shirkey (1974: 358) advise to apply the Bartlett's test of sphericity, which hypothesizes "that the sample correlation matrix came from a multivariate normal population in which the variables of interest are independent. Rejection of the hypothesis is taken as an indication that the data are appropriate for analysis". Besides the Bartlett's test of sphericity, the Kaiser-Meyer-Olkin (hereafter KMO) measure of sampling adequacy should be applied prior to factor analysis. "The index yields an assessment of whether the variables belong together psychometrically and thus whether the correlation matrix is appropriate for factor analysis" (Dziuban and Shirkey (1974: 359). It returns an index between zero and one, where everything above .50 is acceptable and becoming more acceptable when KMO increases (Kaiser, 1974).

EFA has two common purposes; first, by forming factors (i.e. constructs) the data is reduced that allows for more reliable measures. Secondly, EFA allows for testing a hypothesized factor structure for a set of measures. Next to these two reasons, one can use factor analysis for testing a measurement model within structural equation modelling analysis (confirmatory factor analysis), evaluating redundancy among a set of measures or replicating results from a prior factor analysis. (Russell, 2002: 1630).

It is expected that the factors are highly correlated, due to the assumption that their explanatory power is captured by one main construct a better alternative might be principal axis factoring (PAF) (Russell, 2002: 1630-1632). He concludes that "researchers would be wise to use principal axis factoring rather than principal components analysis". It is argued that at least three items per factor are required in principal axis factoring for a factor model to be identified, where including more items per factor results in overidentification of the model. Russell (2002) himself provides a nuance to this statement, as it can be argued that researchers do not necessarily know how many factors will emerge from an exploratory factor analysis. However, because the constructs are derived from theoretical foundations and the researcher therefore most likely has a prediction regarding the model, a researcher is still advised to provide sufficient (i.e. minimum of three) measures (i.e. items) to include in a factor. MacCallum et al. (1999) find that including more measures (more than three) increases accuracy for given sample sizes.

In section 3.5.4.1, I show the internal reliability of the factor questions in the survey (question 18 and question 19) are high enough to be considered on the same scale. Therefore, I create 2 new variables in the dataset called client orientation and information asymmetry, which are the means of the items that load significantly on the factor. These new variables are the proxies for the factors and will be tested in the exploratory factor analysis and the third research question.

The statistical package used, in this thesis 'R', accepts factors that have Eigenvalues higher than 1 as unique factor, whilst looking out for Overfactoring, which is a potential problem for the model's parsimoniousness. Russell (2002) argues that this Eigenvalue approach should only be applied to the

principal component factoring where communalities are fixed at 1.0, whereas for PAF one should apply the 'Scree plot' approach as described by Cattell (1966). This approach requires the researcher to plot the Eigenvalues of the factors and to look for a clear break in value. The number of factors to include is then the $N_{Value\ break} - 1$. Fabrigar et al. (1999) find that this approach realizes a reasonably accurate indication of the number of factors, although there is a common critique that this approach relies too much on subjectivity of the researcher in determining the 'clear' break away of the Eigenvalues. To counter this subjectivity I provide a clear and transparent overview of factor selection and rotation.

Rotating the factors improves interpretability and to compensate for the high correlation the principal axis factoring is conducted using an oblique rotation (e.g. Oblimin). This oblique rotation relaxes the uncorrelation constraint, contrary to an orthogonal rotation (e.g. Varimax). Fabrigar et al. (1999) recommend an approach that first start off with an orthogonal rotation and systematically relaxes the uncorrelation constraint to fit the data better. This approach leaves the data less transformed if the correlation is not too high.

3.3 Method predictors

The third research question aims to explain as to *why* valuators choose a certain valuation method as their dominant valuation method. Based on the theoretical framework described in the literature segment of this thesis a multivariate model is formed. This model consists of three sub-constructs, one main construct and one output variable. The regression with the best fit are multiple logistic regressions, whereas the multinomial logit regression is the best fitting model for the DCF components. The MNL is flexible in its application and provides acceptance for a nominal output variable as well as independent variables.

3.3.1 Variables

3.3.1.1 Dependent variables

The dependent variable or output variable in the valuation method part are DCF and multiples. These two variables are dummy variables indicating "1" if applied and "0" otherwise. This makes the logistic regression binary in nature. In the second part of the multivariate regressions the DCF components that are found to be significantly different among the sub-groups are tested using the multinomial logistic regression, where the dependent variable are the nominal items of the question. This model aims to further explain the preferences of valuators in firm valuation and answers the question as to *how* valuators implement the strands of financial literature (e.g. DCF valuation) actually in practice.

3.3.1.2 Independent variables

The independent variables consist of three hypothesized sub-constructs, as described in 2.3.1 to 2.3.3. The effect of the sub-constructs is expected to be captured by the main construct: The type of valuator. The main construct is *type of valuator* consisting of the three factorial levels. The values here are nominal being the three types of valuators considered.

3.3.2 Methodology

The models are tested for the 5 assumptions that are ought to be considered when applying any form of logistic regression model:

- Assumption of appropriate outcome structure
- Assumption of observation independence

- Assumption of absence of multicollinearity
- Assumption of linearity of independent variables and log-odds
- Assumption of a large sample size

The first assumption is met as the outcome variable is a binary variable, which takes the value "1" if a valuator does apply DCF/Multiples/DCF component and "0" otherwise. The second assumption is also met because the observations are not from repeated measurement or matched data. The third assumption is tested using the VIF approach, where a value higher than 5 is considered potential problem with multicollinearity. If a VIF score is violated this can be dealt with by using a Bayesian logistic regression. From Tables 50 and 51 it can be seen that there are no multicollinearity problems in the final models. This is because the Bayesian logistic regression model is a penalizing model instead of creating a maximum likelihood by iteration. It is considered somewhat more conservative, which is appropriate considering the small sample size.

The fourth assumption is the linearity of independent variables and log-odds which is tested using the Box-Tidwell test, which tests the linearity of the log-odds (i.e. linear predictors) on the numeric independent variables of the model. Categorical variables are not expected to be linearly related to the log-odds of the model's outcome variable.

The fifth assumption is that of a large sample size, which is the ratio between number of variables and observations. My sample size is not large, meaning that I am ought to maintain efficient models, using only few variables as to comply with this fifth assumption. Variables that are highly uncorrelated are stepwise filtered from the model.

3.4 Sample selection

In this study three focus groups have been selected; financial valuators who focus on listed firms, financial valuators who focus on privately held firms, and private equity valuators. To ensure privacy the survey asks the respondent which of the three describes his or her function best, rather than asking for whom they work for. In total, the sample consists of 234 private equity funds and 326 registered valuators from the NIRV, who classify as listed firm focused valuators or non-listed firm focused valuators. Previous research managed a response rate of around 15% (Pinto et al., 2019; Dukes et al. 1996).

To divide the respondents of the survey into the sample groups of listed- or non-listed firm focused valuators two questions are included in the survey. The first is a direct question that asks the respondent which type of valuator describes them best; private equity valuators, listed firm focused valuator, or non-listed firm focused valuator. The second is one where the respondents are asked what percentage of their valuations entails private firms.

The sample is selected by searches for private equity firms in the Netherlands and mailing members of the NIRV who are certified as Registered Valuators. The NIRV consists currently of 326 members according to their website[5], I have sent one survey to them all. Regarding the private equity valuators I have searched online for Dutch Private equity funds and include 234 funds. As reference, the Dutch Association of Private Equity (De Nederlandse Vereniging van Participatiemaatschappijen), hereafter 'NVP', consists of 85 members currently and represents according to the Dutch Chamber of Commerce

[5] https://www.nirv.nl/nl/contact/deelnemers

(Kamer van Koophandel) 90% of all private equity capital in the Netherlands. Therefore this sample not only includes large funds but also the mid- and low-market tier funds.

Given that the two populations are almost in whole considered and whether the respondents of the populations will answer is a random choice, this can be seen as random sampling. This makes it possible to produce generalizable knowledge for the valuation of privately held firms in the Netherlands based on this research. It should be mentioned, however, that in the valuation industry there are many industry players are not experts in business valuation. Business owners, managers or private outsiders value businesses for different reasons also engage in valuations. Using only private equity valuators and registered valuators means that most of them have study backgrounds in finance and specifically business valuation. The results from this study therefore are not generalizable to all of the valuation industry, but as it includes two groups who have studied business valuation, it is generalizable to those in the industry who could be seen as experts in the industry.

3.5 Data collection

3.5.1 Survey design

The preferences regarding valuation methodology is the main measurement objective. The survey that is at the heart of this research is added in Appendix A. Respondents are questioned about preferences in the four streams of valuation methods, about their used multiples, DCF components and final adjustments. In its design the survey adheres closely to the surveys of Petersen et al. (2006), Vydržel and Soukupová (2012) and Pinto et al. (2019). The questions that form the base of the logistic regressions are based on the work of Brounen, De Jong and Koedijk (2004).

Pinto et al. (2019) entails 38 questions from three pillars of valuation. Closely following their study, my survey spans 33 to 42 questions, depending on answers that follow logic chains. The questions consist of 34 closed-ended and 7 open-ended questions. The survey is divided in 5 blocks, these blocks are (1) introduction, (2) purpose of valuing, (3) valuation models, (4) DCF components (5) Final adjustments.

3.5.2 Pretest

The proposed method is a content analysis of verbal protocols where respondents answer four stages or macroprocesses: (1) *comprehension* of the questions, (2) *retrieval* of relevant beliefs and feelings from memory, (3) the weighing of information to form a *judgment*, (4) and the selection of an appropriate *response* alternative. Based on this in the pretest I include these four topics as questions on a 5-point Likert scale.

The sample of the undeclared pretest spanned 30 subjects, which is based on the recommendation of Perneger, Courvoisier, Hudelson, and Gayet-Ageron (2015) and in line with the pretest of Pinto et al. (2019), who selected 22 respondents for his pretest while his total sample included 13,500 equity analysts of the CFA Institute. The respondents are selected at random from the full sample. The pretest's answers might be flawed due to defective questions that are filtered in the final version of the survey, and are therefore, as suggested by priorly mentioned literature, not included in the final results of this study. Besides the pretest's answers, the respondents included in the pretest themselves are not included in the sample for the final survey. This is to prevent pretest sensitization among the respondents, as advised by Dooley (2009: 120). The response rate of the pretest amounted to 16.67%, which is similar to other studies in this subject of literature (Dukes et al. 1996; Pinto et al.

2019). All responses were obtained within one week with 60% of the total answers received within the first two days.

From the pretest it became apparent that the four topics, aforementioned, were all deemed good enough with their means being, respectively, 3.6, 4, 3.8 and 3.6. These means are all above the 'neutral' value of 3, indicating that the questions were easy to be answered, answers could be thought of and formulated quickly based on a good judgment. The variables histograms are compared to those as depicted by Graham & Harvey (2001) and all seem to match well. Based on the pretest's internal reliability, as measured by Cronbach's alpha, items were altered and added to the questions that ultimately form the constructs, as the internal reliability was a bit too low to consider the items on one scale (see 3.5.4.1).

3.5.3 Validity

"Bernard (1988) points out that the qualitative researcher has become immersed in the setting and may well adopt the perspective of the key informants. At the same time, the researcher must retain an outsider's scepticism in interpreting the data. In practice, the analysts must switch back and forth between these perspectives, checking for consistencies and inconsistencies among the various information and observations" (Dooley, 2009: 259). These perspectives are defined as internal and external validity.

Calder, Phillips and Tybout (1982) define external validity as "whether or not an observed causal relationship can be generalized to and across different measures, persons, settings and times". Internal validity is defined as "whether or not an observed covariation can be considered a causal relationship". Usually there is a trade-off in focusing on internal or external validity and finding a balance. Larger samples are more representative for populations and are therefore better in concluding generalized statements for real-world measures. However, larger samples can also be more vulnerable to having spurious relationships as the in-group characteristics can differ significantly. It might therefore be better to collect data from a smaller sample size that can be controlled better for out-of-scope relationships. Next to internal and external validity there is a third type of validity that is of importance in qualitative and quantitative research, called construct validity. "Construct validation is involved whenever a test is to be interpreted as a measure of some attribute or quality which is not operationally defined". The problem faced by the investigator is, "what constructs account for variance in test performance?" (Cronbach and Meehl, 1955: 282).

3.5.3.1 Internal validity

A perfectly internally valid research is one where all external factors are controlled, this means that the study is fully attributable to the outcome. It does however not mean that this study is what was meant to be measured, this is the *construct validity* of the study. A perfect internally valid research has zero generalizability to the real-world context, as all external factors are controlled for and the effects of these are unknown. Following this logic, internal validity is improved by controlling more external factors and confounding variables that intervene between the constructs and the outcome variable.

I take various precautions to prevent internal validity issues in this study. As mentioned in the sample selection section, I have sent out the survey to two complete populations rather than only a selected few, these are registered valuators that are members in the NIRV and all private equity funds in the Netherlands. By including them all I decrease the chance of neglecting views of a certain sub-sample.

As mentioned before, this thesis is not generalizable to all valuations in business as not all valuations are carried out by valuation professionals, but also by management or private investors that seek no advise from private equity funds. The professional valuators however are expected to produce valuations that depict the best valuations.

To prevent influencing respondents by personal experimenter behaviour, the opening statement for the survey as well as the survey itself are standardized following prior literature. The survey is distributed using an anonymous link. Anonymity might prevent the 'Hawthorne effect', where respondents behave differently due to the simple effect of being observed. Regarding the survey, Schober & Conrad (1997) find that when interviewers were free to clarify the meanings of questions and response choices, the validity of reports increased substantially. In a survey this knowledge can be applied by using more open-ended questions, "as open-ended questions' validity and reliability exceed that of closed-ended questions" (Krosnick, 1999: 544). Therefore numerous open-ended questions are added to clarify the ideas of the respondents. To make sure the survey indeed answers the priorly determined hypothesis and research questions, an overview is made of research questions and their hypotheses and their respective questions in the survey (Appendix B).

A risk regarding the internal validity in this thesis is that various valuators from the same firm are included in the survey as they might influence each other regarding their answers. However, to increase the size of the respondent pool these respondents are accepted, also because it could be argued that these proportions of valuators provide a more valid real-world context to the results, this directly relates to the external validity of this thesis.

3.5.3.2 External validity

The external validity is at the core of this study, as the aim is to find generalizable statements regarding the use of valuation methods used by different sub-groups of valuators in the Netherlands. The sample consists of a large part of the population and is diversified, thereby showcasing a real-world context. By including these large proportions of the professional valuator population it decreases the risk of selection bias. The test in cross-sectional in nature, thereby preventing the respondents from filling out the same test more times and changing their answers over time.

The exploration for constructs in the data transformation phase of this thesis is aimed at preventing the exclusion of critical factors that actually have a significant effect on the outcome variable. The exploratory factor analysis might lead to the extension of the hypothesized model but is deemed crucial to validate the nature of the relationship between the constructs. Another perspective of external validity is that of ecological validity, which answers the question whether or not a study is generalizable across different settings such as demographics or time periods. As this thesis is explorative in nature and follows the survey design to some extent of similar studies in Denmark and the Czech Republic, the results are comparable.

3.5.4 Reliability

3.5.4.1 Internal reliability

Internal reliability of a survey is defined as *the consistency in results given by the respondents*. "A reliability coefficient demonstrates whether the test designer was correct in expecting a certain collection of items to yield interpretable statements about individual differences" (Cronbach, 1951: 297). Whereas without validity there cannot be reliability, validity does not mean that there is reliability. Validity therefore is a necessary condition for reliability estimates to make sense (Borsboom

et al. 2004). Cronbach's alpha is calculated to formally test the reliability of items that are regarded to collectively form a construct. The exploratory factor analysis tests for dimensionality of the data into constructs where Cronbach's' alpha tests for inter-item homogeneity. The Cronbach's alpha is tested on the pretest constructs as a measure to optimize the survey accordingly. A Cronbach's alpha higher than 0.70 is deemed as 'acceptable', whereas below 0.70 questions have to be added or changed to appropriately measure the distinct construct(s).

In the pretest, the construct *information asymmetry,* as surveyed by question items industry of object, annual growth, reporting quality, size of the object, ownership structure of the object and tangibility of the assets, consists of 6 questions all related to theories regarding information asymmetry (see section 2.3), that are scaled on a 5-point Likert. For this construct, in the pretest, the initial raw Cronbach's alpha added up to 0.32 however after excluding Q18.4 & Q18.6 regarding the size of the firm and its asset tangibility the Cronbach's alpha is increased to an acceptable 0.703. As 0.703 is still somewhat low, I added two items to the construct: reporting quantity and a direct measurement of information asymmetry. The Cronbach's alpha for the full sample thereby increased to 0.8567, which indicates a strong internal reliability and provides enough support to estimate these items on one scale.

The second construct of the logistic regressions is that of *client orientation,* including the items 'transaction-relatedness', 'sell- or buy side', 'client preference' and 'purpose of valuation'. From the pretest I find that the mean client preference is only 1.8 out of 5, meaning that this item is not deemed important by the respondents in their valuation method selection. The purpose of the valuation was found most important with a mean score of 3.8. Transaction-relatedness and sell- or buy side were slightly important with 3.4 and 3.2 as means, respectively. The overall Cronbach's alpha of the client-orientation construct underperformed severely beyond the scope of transaction relatedness (Q19.1 and Q19.2). The Cronbach's alpha is only -0.072 for all these items, showing no internal reliability. If `Q19.1_3` (client preference) & `Q19.1_4` (valuation purpose) are left out, the alpha increases to 0.9583. However this construct only spans transaction-relatedness and not client orientation. This construct needs reframing of items. Based on the pretest's result I altered the construct in two ways. Firstly, I changed the item 'client preference' to 'story intuitiveness of the valuation towards the client'. Secondly, I added an item that directly asks the deemed importance of client orientation to the valuation methodology selected. For the full data collection sample this renewed construct of *client orientation* did prove to be internally reliable as the new 5-item construct measured an alpha of 0.8704.

3.5.4.2 External reliability

External reliability is often defined as the robustness of a survey, meaning *the extent to which a measure varies from one use to another*. There are two ways to measure the external reliability of a survey; (1) test re-test, which is the stability of a test over time, and (2) inter-rater testing which is the degree to which different researchers give consistent estimates of the same behaviour. This second approach of inter-rater reliability is a valid approach to measure robustness of the survey. The results of all respondents (here 'researchers') and their 'valuator type' are visualized using boxplots and analysed for outliers.

3.5.5 Ethics

This study revolves around a data collection method that involves humans in a direct manner using a survey. The ethical committee of the University of Twente determined the research methodology of this thesis to be conform the ethical standards, based on an analysis regarding avoidance of exploitation, respect for participants, scientific validity and relevance as well as the proper preparations to safeguard confidentiality and privacy of the participants. This study and the corresponding survey adheres to these policies. Participants are made aware that they are free to respond on the survey and can stop filling out the survey at any time. Furthermore, the anonymity of the respondents is guaranteed by using a feature of Qualtrics, the programme that is used to set up the survey. Respondents are made aware that they are able to contact me through email, if they want to receive a copy of the final version of the thesis.

3.6 Summary statistics

For the final dataset I sent out 531 invitations of which 102 surveys were returned, a response rate of 19.21%, slightly higher than that of the pretest (16.67%) and the average response rate in similar literature (16.95%). Of these 102 surveys that were returned 100 provided a non-missing value to the valuator type question, thereby allowing me to make estimations regarding preferences between sub-groups. My sample therefore spans 100 valuators, divided into 20 private equity valuators 78 private firm valuators, and 2 public firm valuators. The sample and its large differences between sub-group count reflects the general Dutch valuation market appropriately as well as the study sample of Vydržel and Soukupová (2012), but the high skewedness (from the low standard deviation Table 1), make it more difficult to draw conclusions regarding differences between the sub-groups. From Table 1 'Valuator role', it can be concluded that most of the respondents are a corporate finance advisor, however consultants, PE and other functions are also well-represented in the sample set.

The education row in Table 1 shows that a high mean (i.e. 4.94) and a relatively low standard deviation, indicating that the sample is highly educated and there are only few differences among the sample. 8 respondents are observed to have an education lower than WO master. My sample has a higher average education than the sample of Graham & Harvey (2001), however this makes sense as they surveyed CFOs, whereas my sample largely exists of registered valuators, which is a post-master itself. These summary statistics are comparable to those of Pinto et al. (2019). The variables experience and age have means of 3.64 and 3.35, respectively (on a scale of 1 to 5, as the minimum and maximum show), where it can be said that age is more or less normally distributed. The experience of the sample is skewed to the right with the most frequent experience bracket being "15+ years" (37.25%). This sample is not only highly educated but also highly experienced, which makes their valuation methods likely to be impactful and representative of the market. The average size of a valuation object, as measured by EBITDA, that the valuators tend to value in their daily work has a mean of 4.37, which is between 1-5 million euros. Most are in the range of 2 to 5 million (22.54%) however the sample is well-spread, also shown by the relatively high standard deviation to both the lower side as well as the higher side of this, with three valuators usually valuing firms that generate EBITDAs larger than €25 million annually.

From Figure 2 it becomes clear that the sample consists mostly of Registered Valuators (77%), as one would expect indeed, however multiple people also hold more than one title, whereas 20% does not hold extra titles. In Figure 3, the purposes of valuation are shown for which the sample tends to value firms, from this it becomes apparent that valuators tend to have a broad range of valuation purposes

and are not necessarily specialized in one approach. Because the range of valuation purposes is so large, this raises the question if valuators have different valuation techniques for different valuation purposes.

Summary statistics

	minimum	*maximum*	*mean*	*std. dev*	*variance*	*count*
Valuator Type	1.00	3.00	2.58	0.80	0.64	107
Valuator Role	1.00	7.00	3.58	1.80	3.22	106
Education	2.00	6.00	4.94	0.69	0.48	107
Experience	1.00	5.00	3.64	1.31	1.72	106
Age	1.00	5.00	3.35	1.09	1.20	107
Valuation object size	1.00	8.00	4.37	1.62	2.62	98

Table 1: Summary descriptives

Figure 2: Extra titles

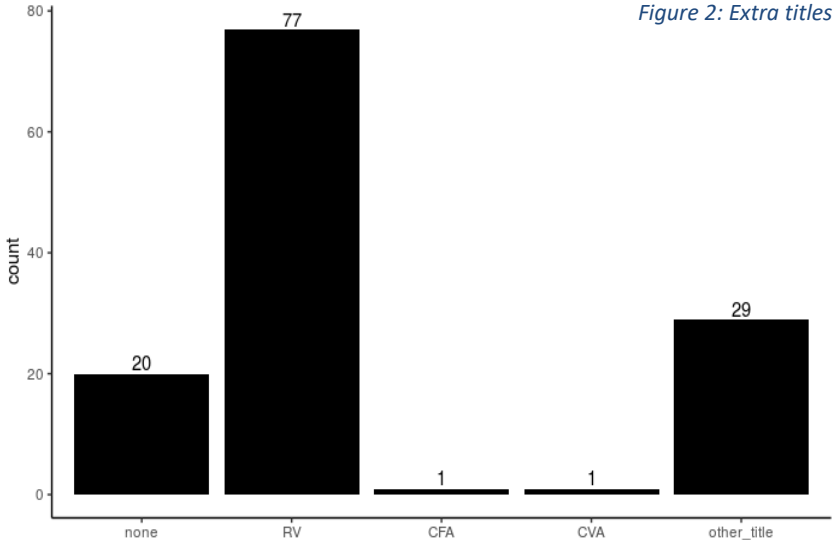
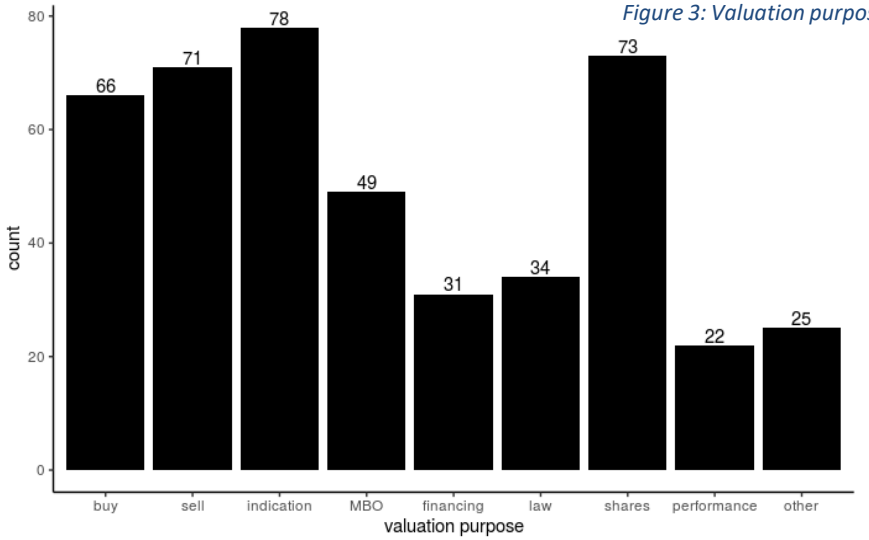


Figure 3: Valuation purposes



4. Results

The data analysis will be conducted using R, which is commonly used in financial literature for statistical analysis. First, I sketch a general picture of how privately held firms are valued in the Netherlands, by answering research question 1. Thereafter I conduct the test regarding research question 2 that delves into the components of the DCF, multiples and the specific adjustments. After the general research questions we aim towards the third, but prior to that the factor analyses as described in sub-section "3.2.1 & 3.2.2" is carried out.

4.1 Valuation models

Research question 1 deals with the question "*What valuation models are used in valuations of privately held firms in the Netherlands?"* and builds on theory as can be found in section 2.1 "Valuation methods". To answer this research question I have formulated four hypotheses as can be found in section 2.1 and the hypothesis list in Appendix B.

4.1.1 General valuation models

Panel A of Table 2 depicts how the respondents implement the various valuation methods in practice. As one can see the DCF is the most used method, 76 out of the 100 respondents have adopted this method in practice. Multiples are thereafter the most popular with 36 respondents noting that they use market multiples and 45 using transaction multiples. Asset-based, other methods and profit-based methods are less popular with adoption rates of 19% and 10%, respectively. Table 2 supports these findings with statistical evidence. The t-test estimate whether the adoption rates of the methods are significantly used more or less than the most used method (i.e. DCF). From the table it can be concluded that DCF and transaction multiples are most used, making them more important to the respondents in the sample set. DCF is most preferred and highly significant at the 99% confidence interval, meaning that I can conclude with 99% certainty that the adoption rate of DCF is not equal to that of any of the other methods. Asset-based, profit-based, and other methods are used least and significantly less used than the DCF or transaction multiples at the 99% confidence interval, indicating low importance. Profit-based approaches are used least from all approaches with a small adoption rate of 10%, indicating that 10% of the sample implements some form of profit-based valuation technique in their valuation process.

T-tests valuation method importance

A) t-test	*estimate*	*t-statistic*	*p-value*
DCF	0.76	-	-
MM	0.36	-8.29	0.00***
TM	0.45	-6.20	0.00***
Asset	0.19	-14.46	0.00***
Profit	0.10	-21.89	0.00***
Other	0.11	-20.67	0.00***
B) t-test	*estimate*	*t-statistic*	*p-value*
MM	0.36	-	-
TM	0.45	1.79	0.07*

Table 2: MM = Market Multiples, TM = Transaction multiples
** = 90%, ** = 95%, ***=99%*

Transaction multiples (TM) are used second-most (45% of the sample). In Section 2.1.2 I describe how one study finds empirical evidence that market multiples are used more by CFA members (i.e. Pinto et al. (2019)) and another study finds that transaction multiples are used more by valuators of privately held firms (i.e. Vydržel and Soukupová (2012)). This could therefore be a private firm effect. Repeating part of section 2.1.2, based on Palea (2016) market multiples are the favoured multiple approach in

firm valuation multiples, as transaction multiples carry some form of survivor bias, as only successful transactions and are considered in this form of multiples, thereby realizing higher equity values than market multiples. Furthermore, transaction multiples incorporate synergy expectations as well as other positive factors that increase transaction prices, which might not be transferred easily to the target valuation at hand. On the other hand, market multiples need to be adjusted for marketability and illiquidity, which might be hard to assess for valuators. From the perspective of a deal-maker it makes sense to value based on transaction values as these provide a realistic value at which a similar firm has sold, however it can be argued that these transaction multiples do not necessarily reflect the fundamental value well. Panel B of Table 2 shows the results of the t-test that compares the adoption rate of transaction multiples with that of market multiples. Transaction multiples are significantly used more than market multiples in this sample set at the 90% confidence level. Therefore, I find supporting evidence to that of Vydržel and Soukupová (2012). This supports the idea that transaction multiples are used more in the valuation of privately held firms because those multiples are more readily available than comparable market multiples.

10 respondents crossed 'Other valuation method' as an answer, if one crosses this option than they are asked to write which option this is. 1 of the answers is a missing value, indicating that the respondent did not fill out which other valuation method they use. 3 respondents note that they use some specific form of DCF methodology, being APV, FCFE and WACC. 1 respondent notes a multiple based on ROI. Another respondent mentions to use a multiple factor * EBITDA based on a Brookz research. Brookz bases their advised multiples on empirical research among corporate finance advisors and their applied multiples for different industries. This is therefore technically a transaction multiples method. 3 respondents use option-pricing methods in their valuations. The last respondents alternative answer is qualitatively quite interesting, he notes that the NIRV pressingly advises the use of DCF-approaches among which there are variants such as the APV and WACC method. Furthermore, he uses the real options methodology and are multiple models more frequently used by private equity parties, about which he writes that these do not make sense 'qualitate qua' (i.e. as such). This respondent lastly states that 'models which are based around accounting values such as asset-based and profit-based models belong in one place, which is the garbage bin'. This statement, albeit somewhat straightforward, points towards the idea that education will be positively correlated to the use of DCF models and that private equity valuators are more inclined to use multiples. Also, asset-based, and profit-based approaches are expected to be less frequently observed, which is indeed the observed effect.

Besides the general findings, I assess the direct impact of valuator type on their preferred valuation method using the Fisher's exact test of independence, as described in section 3.1.3. Although private firm valuators seem to prefer the DCF approach more than private equity valuators from Table 3 presented below, the results of the Fisher's exact test do not point to significant differences between the valuator types. The null hypothesis of the Fisher's exact test is that the categorical variables, i.e. valuator type and the 6 valuation methods, are independent from each other. The alternative hypothesis is that these do have some significant effect on each other. The p-value of the two-sided Fisher's test is 0.6878, indicating that the null hypothesis cannot be rejected, thus the variables are indeed independent from each other. Apparently, it cannot be concluded that valuator type has in this binomial test a significant effect on valuation method choice. To test for robustness I also ran a chi-square test with Monte Carlo-simulated p-values (10000 replicates). The p-value of this test resulted in 0.7584, which, too, is highly insignificant.

N-users valuation method			
	Private Equity	*Private firm valuator*	*Public firm valuator*
DCF	10	65	1
MM	7	27	2
TM	10	33	2
Asset	5	14	0
Profit	2	8	0
Other	3	8	0

Table 3: Valuation methods per sub-group, MM = Market Multiples, TM = Transaction multiples

4.1.2 DCF importance over multiples

The second hypothesis builds upon the first, as it is expected that DCF and multiples are the most used models. It aims to find the balance in which these models are leading in the valuators' models, as described in section 2.1.2. This hypothesis is covered by question 20 of the survey, which has 6 answering options. "1" indicates that valuators do not think DCF is more important than multiples because they only use one. The other 5 answers are on a 5-point Likert scale ranging from totally disagree to totally agree. Therefore, testing this hypothesis consists of two parts, first I have to show that the most frequent answer is not "1", which is shown by testing whether the questions mean is similar to "1" or not. Because if it is then this would mean that a significant proportion of the sample has indicated to use only one of these approaches. Secondly, supporting evidence of this hypothesis would be that the mean answer of those who have not filled out "1", is significantly higher than "4" (i.e. neutral). This shows that indeed if the two methods are both used, that the DCF is favoured over multiples. Table 4 shows the results of the one sample t-test that tests whether the questions mean (i.e. Q20) differs significantly from the mu that is set at "1". With 99% certainty, I can conclude based on this sample that the true mean of this question is not equal to one. The calculated mean of this questions is 3.91.

For the second part of this hypothesis, I exclude the observations of those who have filled out "1" for this question to assess the importance of DCF compared to multiples on the condition that a valuator uses both. In Table 5 you can find the results of the recalculated mean estimate and a t-test with mu set at equal to "4", as this would indicate that both models are equally important (4 being the middle from 2-6). The estimated mean is 4.58 and is with 99% confidence significantly higher than 4. This supports the idea that the DCF is valued more important than a multiples approach when they are applied together. A multiples approach can then for example be used as a quick overview at the end of a valuation presentation to recap the calculation of value or as support for the determined value that comes from the DCF.

DCF & Multiples combined		
estimate	*t-statistic*	*p-value*
3.91	15.32	0.00***

*Table 4: * = 90%, ** = 95%, ***=99%*

Importance DCF-multiples		
estimate	*t-statistic*	*p-value*
4.58	4.27	0.00***

*Table 5: * = 90%, ** = 95%, ***=99%*

Question 24 is an open question which is qualitatively analysed to test whether the findings of question 20 are actually accurate for the sample and if the conclusion that DCF is preferred over multiples also holds in a qualitative setting. 32 out 55 (58%) respondents who filled in Q24 state explicitly to use DCF or a variant of DCF as a primary valuation tool and to use multiples as a check to test DCF assumptions. 11 out 55 (20%) explicitly state how multiples are (a bridge towards) price indication, whereas DCF are a fundamental valuation tool. One respondent describes how it is "depending on the valuation case is DCF the primary valuation tool. Multiples are used to compare indicative values with (transactions in) the market, if available. In case of sale or buy, multiples help lead to a realistic price or offer." This shows an important aspect of valuations, in case of a transaction-related valuation the value derived is also heavily affected by price effects, rather than value effects. 4 out of 55 (7.27%) mention to use multiple valuation methods to derive a bandwidth of price, from this an (intuitive) estimate of value is derived. Then there are 4 respondents who state to use DCF as a primary tool but use asset-based valuations as a "minimum price" or to see if the firm is still value creating over the sum of its parts. 3 respondents explicitly state how the choice of valuation method is irrelevant as all valuation methods should derive the same value if the same business economic factors are provided as input. With this statement they seem to contradict the valuators who use various valuation methods to create a bandwidth to base a value upon. Where most valuators adhere to theory well to state that multiples are only used as sanity-check, multiples are by some still regarded as a "check, that indicates if a valuation is plausible and logical", thereby it might be that some valuators thread lightly on edge where firm valuations are still partially based on multiples, rather than a more theoretically sound DCF approach.

4.1.3 DCF variants

In the following two hypotheses I dive more into the most used approaches, DCF and multiples as these have more specified models. The DCF has 5 clear variants as described in section 2.1.1, these are DDM, FCFF, FCFE, APV, and EVA. The sixth option is again a 'other' option, where respondents are asked to mention which valuation methods they apply in practice. This question is based on a logic-chain where respondents are asked this question only if at question 14, regarding their applied valuation methods, they have answered (among others) the DCF approach. This means that the total respondents who have answered this question is 76.

T-tests DCF variant importance

variant	*estimate*	*t-statistic*	*p-value*
APV	0.80	-	-
DDM	0.16	-15.31	0.00***
FCFF	0.42	-6.69	0.00***
FCFE	0.41	-6.96	0.00***
EVA	0.13	--17.19	0.00***
Other	0.05	-29.09	0.00***

*Table 6: * = 90%, ** = 95%, ***=99%*
N = 76

In section 2.1.1 I argued how FCFF is expected to be the most used variant of the DCF approaches, followed by the FCFE. APV is hypothesized to be used less because it needs more effort due to the variable leverage positions and the estimation of the present value of the tax shield. EVA is expected by used only in very little circumstances due to limited applicability due to its inability to show separated cash flows for operating-, financing- or investing cash flows. EVA is mostly useful for project or option pricing but is harder and more time consuming to implement for the valuation of a whole firm. Theoretically speaking the changing leveraging positions of a firm are best reported using the APV method, however Pinto et al. (2019: 227) deem the FCFF approach (more) appropriate if the firm's capital structure is changing. International empirical research found FCFF and FCFE to be used most of the DCF approaches (Pinto et al. 2019; Vydržel and Soukupová (2012); Petersen et al. (2006).

61 of the 76 respondents who use at least one DCF approach, apply the APV approach in one form or the other (80%), this is surprising and contrasting the findings of Vydržel and Soukupová (2012), Petersen et al. (2006) as well as those of Graham & Harvey (2001). In their studies, they find APV adoption rates of 5.0%, 2.6% and 10.0%, respectively. Pinto et al. (2019) do not describe the use of APV models explicitly but add it into the discounted free cash flow models, for this group they find an adoption rate of 86.8%. FCFF and FCFE are used by 42% and 41%, respectively, but are used significantly less than the APV approach. The limited use of the DDM is in-line with the findings of Vydržel and Soukupová (2012); Petersen et al. (2006), who also find adoption rates of around 16%. Pinto et al. (2019) find that the DDM is adopted by 35.1% of their sample. This once again might be a supportive argument that the DDM is deemed less applicable for valuing privately held firms than public firms. Another argument would be that the preference of the DDM has faded over time, however then the findings of Pinto et al. (2019) could be described as rather surprising. The EVA approach is as expected used least by the respondents with only an adoption rate of 13%, which is significantly less than the three most used approaches.

Respondents ticked the 'other' category, 2 of these respondents describe to use the WACC approach (in combination with other DCF approaches). The WACC approach is covered in this thesis by the FCFF, where the total firm value is calculated by using WACC as discount rate. Another respondent describes to use a multi-period excess earnings in combination with lost profit and incremental income. These approaches are focused more on earnings and less on cash flows. The last of the four describes not to use DCF but asset-based multiples as primary valuation methodology, because "the DCF is too theoretical".

In Table 7, I compare the use of the different usage counts of the DCF variant among the sub-groups in a similar fashion to hypothesis 1 in section 4.1.1. Based on the matrix, representing the count regarding the use of a valuation method for each specific valuator type, I run a Fisher's exact test of independence. From Table 7 one thing becomes clear immediately and that is that the public valuators apparently do not use any of the common DCF variants. The answer provided regarding which `Other DCF` approach is applied by the one public firm valuator is "none". Private equity valuators seem to have a strong preference for FCFF and FCFE with 10 out of the total 13 variants used. The private firm valuators are seemingly not as fond of the FCFF and FCFE approaches as they are of the APV approach, having the support of 59 private firm valuators that use a form of DCF (of the 76 who used a form of DCF). The Fisher's exact test of independence is highly significant with a p-value of 0.031, which means that there is a significant difference in counts between the sub-groups, indicating dependence between the grouping variable and the valuation methodology variable. The observed differences in DCF-variant usage are statistically supported, a chi-square test with Monte Carlo-simulated p-values provides even stronger evidence for dependent effects between the two variables with a p-value of 0.005. These results are however no longer robust when the public firm valuator category is excluded from the tests. The Fisher's test and chi square test are in this scenario insignificant with p-values of 0.162 and 0.169, respectively.

N-users DCF valuation method

	Private Equity	*Private firm valuator*	*Public firm valuator*
DDM	1	11	0
FCFF	5	27	0
FCFE	5	26	0
APV	2	59	0
EVA	0	10	0
Other DCF	0	3	1

Table 7: DCF Valuation methods per sub-group.

4.1.4 Multiples variants

Hypothesis 4 deals with the preferences of valuators in their use of multiples in valuations, specifically which kinds of multiples are preferred. In question 21, which is not a logic-chained question, meaning that all 100 respondents had the possibility to answer. The three most used multiples are EV/EBITDA, EV/EBIT and EV/sales, and the three lowest are price/book, price/sales, and quite surprisingly the price/earnings multiple. 11 respondents noted not to use any multiples and 9 mentioned to use other multiples.

T-tests multiple variant importance

Multiple	*estimate*	*t-statistic*	*p-value*
EV/EBITDA	0.63	-	-
None	0.11	-16.54	0.00***
Price/sales	0.05	-26.48	0.00***
EV/profit	0.17	-12.19	0.00***
Price/book	0.04	-29.96	0.00***
Price/earnings	0.10	-17.58	0.00***
EV/EBIT	0.45	-3.60	0.00***
EV/sales	0.27	-8.07	0.00***
Other multiple	0.09	-18.78	0.00***

*Table 8: * = 90%, ** = 95%, ***=99%*

In section 2.1.2 I provided an overview of the literature on the use of multiples in firm valuations. Lie and Lie (2002) found that EV/EBITDA outperforms in valuation accuracy EV/EBIT because biases in depreciation distorts true values. Furthermore, they found that market value to book value (price/book) is less biased than earnings and sales multiples. Damodaran (2007) deems EV/EBITDA a good proxy for value too. In empirical studies, P/E and EV/EBITDA multiples are found to be used most in practice. I predicted based on this literature that price/earnings multiples and EV/EBITDA were the most used multiples, whilst price/book is underused based on its prediction accuracy.

Table 8 shows the results of the t-test of the multiples to the EV/EBITDA adoption rate. From this we can confirm that the EV/EBITDA is used most and is significantly used more than any other multiple with an estimated adoption rate of 63%. EV/EBIT follows with a significantly less than EV/EBITDA adoption rate of 0.45 (99% CI). EV/sales is used by 27% of the sample. Interestingly, price/earnings are significantly used only by 10% of the sample and the price/book ratio by only 4%.

The 9 'other multiple' answers given by the respondents are groupable into 4 categories. The first category includes 5 observations who do not necessarily provide a multiple in the textbox, but note that multiples are only used as sanity check, one even goes as far to state that multiples are for advisors who do not understand the concept of economic fundamental value, they are solely applicable as sanity check. Then there are 2 observations of respondents who use EV/EBITA as their preferred multiple, 2 describe to use industry multiples (usually based on EV/EBITDA) and 1 uses EV/ARR (i.e. annual recurring revenue), which is more commonly used in the software industry and valuing start-ups. The Fisher's exact test of independence executed on the data of Table 9 gives a p-value of 0.866 the chi-square test gives a p-value of 0.0.850. I retest the sample data with an exclusion of the public firm valuators, as their data is so limited. However, also here I find no significant findings, as the p-values are 0.528 and 0.431 for the Fisher's exact test and the chi-squares test, respectively. These outcomes point to the idea that these variables are independent of each other. In this form one cannot use the type of valuator to predict which multiple they apply in their practices. From Table 9 It appears that private firm valuators sometimes do not use multiples whereas private equity valuators always use some form of multiple, as "none" is equal to zero. However, based on an ANOVA with "no multiples" as dependent variable (i.e. dummy) and "valuator type" as independent (grouping) variable the difference between private valuator and PE valuators is 1.410, however this difference is insignificant (p-value of 0.174).

N-users multiple variant			
Multiple	*Private Equity*	*Private firm valuator*	*Public firm valuator*
None	0	11	0
Price/sales	0	5	0
EV/profit	4	12	1
Price/book	0	4	0
Price/earnings	1	9	0
EV/EBIT	8	35	2
EV/sales	8	18	1
EV/EBITDA	12	49	2
Other multiple	2	7	0

Table 9: Multiples per sub-group

4.1.5 Conclusion research question 1

In the section 4.1.1 to 4.1.4 I answered four hypotheses, stemming from the first research question, which reads: "*What valuation models are used in valuations of privately held firms in the Netherlands?"*. DCF and multiples are indeed used significantly more than asset-based and profit-based models. It suits to state that the valuators in the sample appear to adhere well to the theory of valuation methodology selection in their valuations. Interestingly, I find that transaction multiples are preferred over market multiples (i.e. comparables), similar to the findings of Vydržel and Soukupová (2012) and contrary to those of Pinto et al. (2019) as well as the proposed theory of Paleo (2016). Apparently, the availability and incorporating of synergy and price biases outweigh the effort that would go into finding comparables and adjusting these. Both DCF and multiples are used simultaneously, however DCF is the primary valuation tool and preferred over multiples, which are mostly used as a sanity check.

APV is the primary DCF variant for most valuators (80%), followed by FCFF and FCFE, contrasting findings of earlier studies who found only little portions of their sample using APV. APV best depicts the changing capital structures of the firm and the present value of the tax shield. It might be an educational effect that is taught at the NIRV. However, it might also be that the private firm valuators observe highly variable capital structures and want to split up the value of the tax shield to highlight risks to their clients.

The last hypothesis dealt with the usage of multiples, of which EV/EBITDA and PE multiples were hypothesized to be used most. EV/EBITDA performed as expected, it is used most and significantly used more than all other multiples. The P/E multiple usage underperformed, which might be sample specific or a private firm effect. All in all, it can be stated that the three sub-groups apply the valuation methodology well, in the sense that if multiples are used than at least the EV/EBITDA multiple is preferred over PE multiples. EV/EBITDA is found to be least distorted whilst being representative of the market value.

To add some more nuances from a qualitative perspective I added questions 23 to the survey, which asks the respondent as to why they use the models that they use. 64 respondents filled out the open

question 23. The most often mentioned reasonings as to why valuators prefer one method over the others or prefer a set of valuation methods is due to their theoretical and conceptual accuracy, 19 respondents explicitly mention how this is the most important factor in their valuation method trade-off, examples of answers in this category are “methodological consistent”, “practically applicable, and “theoretically very well defendable”. The other factor that appears to be a key factor in deciding in the trade-off between valuation models is practical applicability and simplicity. An example is one valuator who mentions how he “clearly prefers this model [APV], as the WACC is vague and more difficult to understand for outsiders”. 18 respondents provide an answer which falls under this category. Valuators who use more than one DCF variant or a multitude of valuation methods, tend to provide two types of answers which fall under the categories: control and purpose. An examples of control-based model selection and “multiple methods are calculated because of their different perspectives and combined lead to a final value”. The category “purpose” includes answers that state that the purpose of a valuation is the key selection factor.

The majority of the sample has a strong preference for one or few models because of their theoretical foundations and practical applicability. It appears that the ability to explain the model to the client is of importance to some, whereas others prefer the ability to work with a model in different circumstances. Valuators who tend to apply various models seem to base this on the purpose of the valuation, the industry of the firm or to establish a sanity-check where all methods should return a similar value.

4.2 DCF components and adjustments

In this section I present the results regarding research question 2, which is “How are these models applied?”. This section covers 6 sub-components of the DCF, 1 sub-section regarding the final adjustments and is closed with a chapter summary. In this section I cover another 13 hypotheses on top of the 4 hypotheses described in section 4.1.

4.2.1 Cost of capital

4.2.1.1 Constant versus variable WACC

The cost of capital is applied in the WACC-based approach FCFF, which is hypothesized to be used most. In the APV and FCFE approach however the discount rate is not based on a company-wide cost of capital but on the cost of equity. In the case of the APV the present value of the tax shield is then added.

T-test constant - variable WACC

	estimate	*t-statistic*	*p-value*
No WACC	0.35	-	-
Constant	0.24	-2.56	0.01**
Variable	0.08	-9.90	0.00***
Dependable	0.08	-9.90	0.00***

*Table 10: * = 90%, ** = 95%, ***=99%*

Hypothesis 5 states that a variable WACC is used more often than a constant WACC, based on the theory that smaller firms (i.e. SMEs) or firms in unstable industries will have variable capital structures. Vydržel and Soukupová (2012) found that private equity valuators tended not to use variable WACCs but constant ones, as in their opinion the value would only be affected minorly. They also found that private firm valuators tended to use variable WACCs more than constant ones. These findings could be argued to be supporting the idea that PE valuators are less affected by details than private firm valuators are, as they do not report to a client.

N-users WACC variant			
WACC	*Private Equity*	*Private firm valuator*	*Public firm valuator*
Constant	7	15	2
Variable	0	8	0
Dependable	0	8	0
No WACC	3	32	0

Table 11: WACC preferences per sub-group

In my sample I find first of all that most respondents do not use the WACC approach at all (Table 10). This makes sense as in hypothesis 3 it already became apparent that most valuators use the APV methodology which requires no WACC, but only a cost of equity to discount cash flows to the equity holders. The "no WACC" option is adopted by 35% of the sample, which is significantly higher than any other adoption rate. However, from the valuators who do use some form of DCF that does require a WACC, I find that 24% of the sample uses a constant WACC, whereas only 8% applies a variable WACC throughout their forecast period.

Regarding the differences in sub-groups, 70% of the private equity valuators applies a constant WACC, whereas none apply a variable WACC. From the private valuators, 23 apply some form of WACC, of which 65% applies a constant WACC and 35% prefers a variable WACC. 51% of private valuators does not use WACC at all, compared to 30% of the private equity valuators. The two public valuators both use constant WACCs in their valuation, however the limited number of public valuators prevents me from statistical evidence testing for that sub-group. The Fisher exact test of independence results in an outcome of 0.042, similarly the chi-square test with Monte Carlo simulated p-values finds 0.035. The tests p-values are significant at the 95% confidence level, meaning that the valuator role variable is dependently related to the WACC selected.

4.2.1.2 Calculation of WACC weights

Hypothesis 6 deals with how the weights in the WACC for equity and debt are calculated, it reads: *"Weights of the WACC are equally likely to be based on market values or book values"*. Theory describes that market values should be preferred over book values to accommodate for potential accounting biases that deviate book value from true value (Titman & Martin, 2014). Two approaches to proxy market value are the book value of all interest-bearing debt or by considering a peer industry capital structure.

Once again, the most frequent answer among the respondents is "No WACC", meaning that the method of valuation used by the valuator does not require any WACC calculation. From Table 12 it can be observed that in selecting WACC weights, book values are used least by all

T-test WACC weight selection			
A) WACC	*estimate*	*t-statistic*	*p-value*
No WACC	0.48	-	-
Book values	0.03	-21.36	0.00***
Target structure	0.25	-3.43	0.00***
Industry peer	0.09	-9.86	0.00***
Market values	0.20	-4.88	0.00***
B) T-test	*estimate*	*t-statistic*	*p-value*
Market values	0.20	-	-
Book values	0.03	-9.26	0.00***
Target structure	0.25	1.05	0.29

*Table 12: * = 90%, ** = 95%, ***=99%*
N = 75

respondents (i.e. only 3%) and a target structure of equity and debt is used most by the sample (i.e. 25%). Market values are used by 20% of the sample, which is significantly more than book values (panel B), thereby not being consistent with the hypothesis. Market values are used more than book values when setting WACC weights. A target structure could also be an approximation of market value by the valuators, target structure is not significantly different from market values' adoption rate.

Considering the split-sample there are some noticeable differences between the groups. First of all, the the private firm valuators do not use WACC more often than private equity valuators, which is consistent with 4.2.1.1. When statistically tested both the Fisher exact test of independence and the Chi-square test do not find significant differences between the sub-groups and their preferences regarding WACC weight selection. In general it can be stated that all groups seem to adhere to the theory well and a significant proportion of them makes use of market values of capital where possible and steers away from book values.

N-users WACC variant

	Private Equity	*Private firm valuator*	*Public firm valuator*
Book values	1	1	0
Target structure	4	14	1
Industry peer	0	6	1
Market values	2	13	0
No WACC	3	29	0

Table 13: N-users WACC variant

4.2.2 Cost of equity

In this section I present the findings on three hypotheses that are part of the cost of equity determination. It starts off with a general approximation similar to hypothesis 1 and 3 on valuation methods, as the seventh hypothesis aims to find an answer to which method is most used in estimating the cost of equity (e.g. build-up method/bottom-up approach or the CAPM). The eight hypothesis helps analyze how the risk-free rate is determined. The nineth hypothesis deals with the estimation of beta, which is used only in CAPM or variant of CAPM.

4.2.2.1 Cost of equity derivation

In section 2.2.1.1 I describe two key methods on how the cost of equity can be derived from a broad perspective. These two methods are the well-known, declared both dead and alive, CAPM and the intuitive build-up method. As mentioned in this section, CAPM is widely known and criticized over the years due to its flawed assumptions and the little explanatory power of beta, yet it has been found to still prevail in other research (Graham & Harvey, 2001; Petersen et al., 2006; Welch, 2008). Boudreaux et al. (2011) adds to this the extra risk privately held firms face when valued using CAPM, as they are not publicly traded and their beta as well as the market risk premium are more difficult to measure. The other approach, the build-up approach, is proposed as a simpler, humbler, and more intuitive approach to determine the cost of equity. Pratt (2008) proposed various building blocks that could be added as discount to derive a final cost of equity, such as key persons or trapped-in capital gains.

The first hypothesis regarding the cost of equity is that the build-up method is used more than CAPM in valuing privately held firms. From Table 14 it can be seen that CAPM has an adoption rate of 13% for the sample, which is the second highest adoption rate. The build-up or bottom-up appraoch is a lot more preferred by the respondents in this sample. 38% of the sample uses build-up as their cost of equity derivation approach. The build-up approach is signficantly more used than CAPM by the valuators in this sample.

T-test Cost of Equity derivation

re approach	*estimate*	*t-statistic*	*p-value*
Build-up	0.38	-	-
CAPM	0.13	-7.40	0.00***
Mod CAPM	0.09	-10.08	0.00***
IRR	0.07	-12.09	0.00***
Experience	0.05	-15.07	0.00***
Other method	0.05	-15.07	0.00***

*Table 14: * = 90%, ** = 95%, ***=99%*
mod = modified CAPM

From the same table some differences in preference between the sub-groups. The most preferred method for the private equity valuators is IRR, which is similar to the net present value approach. The second highest used approach is experience, indicating a subjective measure to estimate cost of equity. For the private firm valuators these proportions are different, IRR is only used by one private firm valuator and the most preferred measure is clearly the build-up approach. The statistical tests confirm these differences at the 99% confidence interval.

5 valuators checked the "other method" option, of these 5, 3 refered to an article of BDO, which has published the SFP (Small Firm Premium) model, a formal model where 7 factors are identified which signficantly impact the firm-specific risk. This model quantifies risk-factors based on empirical research and is applied next to a illiquidity (marketability) premium. 1 valuator uses the certainty equivalent method and two describe how the case is leading in cost of equity estimation, CAPM or bottom-up, one of the describes that it depends on the data availability regarding beta and how to unlever and relever this figure. The build-up method is not preferred by this valuator, who states to worry that this method is affected by selffulfilling-prophecy, where the estimate is set at which is needed to be set.

N-users cost of equity derivation

re approach	*Private Equity*	*Private firm valuator*	*Public firm valuator*
CAPM	2	10	1
Mod CAPM	1	8	0
IRR	6	1	0
Experience	3	1	1
Build-up	0	38	0
Other method	0	5	0

Table 15: N-users cost of equity derivation approach

4.2.2.2 Risk-free rate derivation

The second component of the cost of equity is the risk-free rate, about which in section 2.2.1.1 it is stated by Boudreaux et al. (2011) that it is usually estimated by the current yield on the twenty-year US Treasury bonds". Alternatives to use are the LIBOR or T-bills with country premiums if the country

is riskier than US T-bills. However, it is expected that the risk-free rates are not based on the LIBOR or US treasury bonds but on the T-bills or T-bonds of the Dutch government, due to the low country risk and expertise of the valuators on the Dutch market. The maturity of the bond most used as risk-free rate is 20 years.

Tables 16 shows the adoption rates regarding the preferred risk-free rate proxies. The less than 1-year risk-free rate proxy (1-year T-bill) is use by only 1 respondent. The most used risk-free rate proxy is the 10-year with 30% adoption rate, and is significantly higher than the <1 year, 20-year, and 30-year. This is evidence against the hypothesis. This maybe because the current times (i.e. the COVID-19 pandemic and global trade wars of 2020) affect the foreseeable stable future.

T-test Risk-free-rate derivation

RF derivation	*estimate*	*t-statistic*	*p-value*
10 year	0.30	-	-
<1 year	0.01	-29.00	0.00***
20 year	0.09	-7.30	0.00***
30 year	0.11	-6.04	0.00***
Other	0.25	-1.15	0.253

*Table 16: * = 90%, ** = 95%, ***=99%*

Interestingly, the second highest scoring category is the "Other" category with an adoption rate of 25%, meaning that 25% of the sample uses another proxy for the risk-free rate. Of these 25 observations, 2 state explicitly to use a risk-free rate that is equal to the duration of the cash flows. 2 use the longest Dutch bond available, 2 use the expected Dutch long-term real interest because "the current 10-year is negative, Now expect long-term return matching long-term growth (1.8%)". 4 respondents use the Dutch 10-year bond but adjust (normalize) it for current ECB measures. Then there are some individuals who use international bonds, such as the German 10- or 20-year bond, 20-year IRS (4.5%), 30-year EURObond (9%), long-term US 20- or 30-year (with a country premium) (13.5%). Other risk-free rates mentioned are interest-swaps, a synthetic risk-free rate or derivation from market risk Tables for the Netherlands from http://www.market-risk-premia.com/nl.html, who base their market risk premium on the classic CAPM market risk premium as described by Berg, Heigermoser, Kaserer, Kittlaus and Willershausen (2017). It appears there is quite some disagreement on the "right" risk-free rate proxy that is used in valuation models. This disagreement spans over the sub-groups as well as thrive within them.

N-users RF proxy

Proxy	*Private Equity*	*Private firm valuator*	*Public firm valuator*
<1 year	0	1	0
10 year	7	22	1
20 year	0	9	0
30 year	0	11	0
Other	4	20	1

Table 17: N-users RF proxy per sub-group

Table 17 depicts that the sub-groups appear to have quite similar preferences, in all three sub-groups the "10-year" and the "other" category score high in their usage counts. With p-values of 0.480 and 0.479 the statistical tests also do not point towards significant differences between the sub-groups.

The sub-groups thereby seem to deviate from theory, however in the turbulent time period, where the financial crisis is still less than 15 years ago, a shorter risk-free rate proxy is understandable since a period longer than 10 years might mean that the proxy is actually not that risk-free. Another explanation for this is that the current risk-free rates are so low, and it is estimated by the valuators that this zero-interest is unsustainable for the future. If this is the case than a longer-term forecast would not be sensible.

4.2.2.3 Beta estimation

In 4.2.2.1 it was found that 22% of respondents use some form of CAPM (i.e. 13% CAPM, 9% modified CAPM), this means that still almost one fourth of the valuators use CAPM and thereby Beta in their valuations. As described further in 2.2.1.1, *Beta* is the coefficient that demonstrates the corresponding relationship in terms of the systematic risk between the expected return on equity of a levered and unlevered firm. Solnik (1974) proposed to set up a peer group of similar companies, calculate the median of their unlevered betas, relever this to the target's financing structure and use this as final beta estimate. In more recent studies peer group-based beta estimation was still found to be most popular among professionals (Petersen et al., 2006; Steiger, 2010; Vydržel & Soukupová, 2012).

T-test beta derivation

Beta	*estimate*	*t-statistic*	*p-value*
Comparables	0.41	-	-
Profit regression	0.00	-	-
Industry Beta	0.41	0.00	1.00
Experience	0.00	-	-
Other method	0.18	-2.70	0.01**

*Table 18: * = 90%, ** = 95%, ***=99%*
N = 22

Other methods described in section 2.2.1.1 are regressions on the profit, and based on experience, which would be a subjective estimation of the beta. Profit regressions and experience are not at all used; therefore a t-statistic and p-value cannot be calculated. Table 18, displays that all 22 individuals who use CAPM or MOD CAPM, thereby limiting the sample for this hypothesis. Of these 22 observations, 41% uses comparables and 41% uses industry beta on a peer-group basis. 18% (4 observations) uses some other method to derive beta for their calculations. The findings are similar to what theory prescribes and what other empirical studies find. The Dutch valuator are in that aspect consistent with what other European valuators use when estimating beta of a privately held firm.

Among sub-groups there is some difference, as private equity valuators have other method as highest count option and privately held firm valuators use a peer-group based industry beta as their preferred method. These differences are significant at the 90% confidence level based on a Fisher exact test (p-value 0.092) and a chi-square test with Monte Carlo simulation (p-value 0.089). The main difference comes from the industry beta method as private equity valuators and public valuators do not use this approach at all, whereas it is most used by the private firm valuators.

The "Other methods" described by the four respondents are from 2 PE valuators and 2 private valuators. One PE valuator describes to use comparables, but with a firm-specific risk estimation, the other describes to use Damodaran Europe industry betas, or an own beta estimation model. The two private valuators both state to use a combination of comparables and an industry peer group.

N-users beta estimation

Beta	*Private Equity*	*Private firm valuator*	*Public firm valuator*
Comparables	1	7	1
Profit regression	0	0	0
Industry Beta	0	9	0
Experience	0	0	0
Other method	2	2	0

Table 19: N-users beta estimation per sub-group

4.2.3 Cost of debt

This section deals with the estimation of the cost of debt, it entails only one hypothesis which is fairly general in nature and is based on section 2.2.1.2 of the literature chapter. Four methods for cost of debt estimation are provided by Titman & Martin (2014) (1) firm's book value, (2) effective interest rate based on its yield to maturity (YTM), (3) an industry average, (4) a synthetic bond rating.

T-test Cost of debt (Rd) derivation

Rd	*estimate*	*t-statistic*	*p-value*
Eff interest	0.55	-	-
Book interest	0.12	-11.30	0.00***
Eff industry	0.12	-11.30	0.00***
Synthetic	0.03	-27.77	0.00***
Other Rd	0.19	-7.95	0.00***

*Table 20: * = 90%, ** = 95%, ***=99%*
Eff = Effective
N = 75

Prior empirical research found that market values prevailed over book values, as Petersen et al. (2006) found a strong preference for the effective interest rate (75.8%), Vydržel and Soukupová (2012) found an adoption rate of 48% (still the highest). The market values of interest are proxied by the effective interest rate, as it is assumed that in the future the firm is able to loan at the same rate. They found that the different sub-groups agreed that the effective interest rate was best suited, however different groups combined different methods to estimate a final cost of debt. Theoretically, if the firm is able to lend at the same rate as its current debt payment obligations, the best proxy for market values is the effective interest rate. It is therefore assumed that this method is most used compared to the other methods.

From Table 20 it is clear that the most used method is the effective interest rate method for estimating the cost of debt, as 55% of the valuators apply this method in practice. Thereby being significantly higher (99% CI) than any other AR. It is followed by *other Rd* estimation methods, which is ticked by 19% of the sample. A synthetic bond rating is used least (3%) of the sample, and all though it seems sensible since privately held firms do not have a public bond rating, it still is remarkably contradicting the findings of earlier empirical studies. Book interest and effective industry average are used by 12% of the sample.

Across sub-groups there are only little differences in their preferences. Statistically, the differences in preferences among the groups are not significant, the Fisher exact test returns a p-value of 0.747 and the chi-square test of independence returns a p-value of 0.799. Both tests thereby returning highly insignificant results, indicating that the differences between sub-groups are not large enough to conclude a depending relationship between the valuator type and cost of debt estimation method.

14 respondents stated to use some kind of “Other method” to estimate the cost of debt. 1 of these 14 did not fill out which cost of debt approach they use, leaving me with 13 responses. Of these 13, 3 state it is “not applicable to their valuation method”. 5 respondents state to use a market-conforming rate, related to the riskiness of debt, or as one puts it “based on the usual market interest related to the riskiness of the loan at hand”. One valuator bases the cost of debt on the cost of debt of the viewing firm. This estimation makes it as such, that the valuation object is valued at the value for the viewing and potential buying firm, it incorporates value-effects specifically related to the viewing firm. Valuators should thread carefully with this approach, as to not count premiums double. One basis the cost of debt on the “beta debt between 0.2 and 0.4”. 2 valuators use a combined figure using a risk-free proxy and adding a credit spread based on a synthetic credit rating of the firm (from Capital IQ).

N-users Cost of debt derivation

Rd	*Private Equity*	*Private firm valuator*	*Public firm valuator*
Book interest	1	8	0
Eff interest	5	35	1
Eff industry	2	6	1
Synthetic	0	2	0
Other Rd	2	12	0

Table 21: N-users Rd estimation

4.2.4 Tax rate

T-test marginal versus effective tax rate

Tax rate	*estimate*	*t-statistic*	*p-value*
Effective tax	0.35	-	-
Marginal tax	0.23	-2.47	0.02**
Other	0.03	-17.09	0.00***
No WACC	0.40	0.937	0.35

*Table 22: * = 90%, ** = 95%, ***=99%*
N = 75

In section Limitation 2.3.1.3 I set out the literature regarding the choice between the effective tax rate and the marginal tax rate a firm faces. It is estimated that the marginal tax rate is better reflecting fundamental value differences in future cash flows because the effective tax rate includes accounting effects that are unsustainable for longer periods of time. As an example the effect of deferred taxes or depreciation rates are affecting the effective tax rates while such events should be normalized in valuations, as these are not fundamental value considerations. In recent empirical studies the tax trade-off has not been analysed, while there is a clear theoretical preference. A limitation of this section is that the survey question on tax is included in the block of questions surrounding the WACC estimation, therefore the answer possibility “No WACC” is included. Since most valuators use APV in their valuations, they do not use the WACC and quite possibly ticked “No WACC” for an answer. However, also in APV the tax rate is especially of importance, namely in calculating the present value of the tax shield the debt load is multiplied by the tax rate and the interest. It might be that due to “No WACC” option, some data has been lost, the total number of people that filled out this question is 75.

Table 22 shows actually evidence against the hypothesis that marginal tax rates are more often applied than the effective tax rate. Furthermore, Table 22 shows that indeed “No WACC” has been selected by 40% of the sample, which prevents us from analysing their answers outside of the scope of the

WACC (e.g. in their application of the APV). However, from this sample 35% of the valuators mentions to use the effective tax rate, compared to only 23% who use the marginal tax rate. The one-sample t-test, where the mu is set equal to the marginal tax rate shows that the effective tax rate is significantly used more than the marginal tax rate (at the 95% CI). Apparently, valuators do not fully agree with the theory on tax rates, or they feel that the effective tax rate does not deviate too much from the marginal tax rates, or something prevents them from translating the theory to practice.

Based on Table 23 and the statistical Fisher's exact test and the chi-square test of independence, there is no reason to assume that the two variables are dependently related, the sub-groups have no statistically observable differences in their tax rate usage. The Fisher's exact test resulted a p-value of 0.671 and the chi-square test resulted p-value of 0.746, thereby being highly insignificant at any traditional level.

2 private firm valuators opted for another type of tax rate selection, the first stated it is depending on the length of time before the effective tax rate is equal to the marginal tax rate, this seems to indicate that this valuator indeed rightfully applies the theory as described by Damodaran (2012), who states that if the effective tax rate is affected highly by accounting standards that the marginal tax rate is the safer tax rate to use in discounting future cash flow. The second private firm valuators states that if there are too many issues with calculating the WACC, the APV should be applied. It can be argued, however, that if one then does apply the APV the issue of tax rate estimation is still at hand. The respondent seems to indicate as well that the APV is better in portraying difficulties in the effect of the capital structure, something that supports earlier statements made in 4.1.3.

N-users tax rate variants

Tax rate	*Private Equity*	*Private firm valuator*	*Public firm valuator*
Effective tax	5	20	1
Marginal tax	2	14	1
Other	0	2	0
No WACC	3	27	0

Table 23: N-users tax rate variants

4.2.5 Terminal value

This section consists of two parts, the terminal value model selection and the determined growth rates, which are used to calculate the terminal value. First, I cover the model selection and then the growth rates, selected by valuators.

4.2.5.1 Terminal value model

In section 2.2.2 I quoted Petersen et al. (2006: 40) on how "the terminal value often accounts for 60–80% in a DCF-valuation and should capture the major parts of value creation". Four approaches to estimate terminal value are (1) Gordon growth model, (2) multiples, (3) value driver model, and (4) the convergence model. The question in the survey which covers the terminal value models is question 26.

Empirical studies in other countries found that the Gordon Growth model is used most by valuators, with 67% of the respondents and 80%, respectively. Where in the research of Vydržel and Soukupová (2012) the multiples approach was almost as frequently used as the Gordon Growth model (64.4%), Petersen et al. (2006) found that only 14.3% of their sample used multiples-based terminal valuation.

From the theoretical perspective the models have different purposes, the Gordon Growth model assumes a constant growth after the explicit forecast period, however, is flexible enough to adjust the growth rate. The value-driver model allows for extra insights regarding the efficiency of the invested capital, which might be worthwhile for those who have a financial stake in the company (e.g. private equity valuators). The convergence model assumes that growth does not affect firm value, indicating a growth rate of zero. This model could be used for firms that do not have future cash flows, such as liquidated firms. Lastly, multiples can be used in a similar way for terminal value estimation as you would when valuing a firm with multiples as a whole and could provide a quick and easy measure in combination with a more comprehensive explicit forecast period estimation. Due to its flexibility and the empirical findings of earlier studies it is expected that the Gordon Growth model is used significantly more than the other methods.

Table 24 confirms the hypothesis that the Gordon Growth model is used most by the valuators in our sample. With an adoption rate of 53%, it is slightly less used than in the other international empirical studies, however it still outperforms the other options by a large margin. The second highest ranked model is the value-driver model, which is the most used model by the private equity valuators (36%). This could be argued as support for the idea that private equity valuators are keen on knowing what the current returns on invested capital are to estimate their potential profits whilst considering investing themselves, supported by the idea that it is the most used model for this sub-group.

T-test TV-models

TV-models	*estimate*	*t-statistic*	*p-value*
Gordon Growth	0.53	-	-
Conversion	0.09	-15.30	0.00***
Multiples	0.09	-15.30	0.00***
Value-driver	0.36	-3.52	0.00***
Other TV	0.13	-11.83	0.00***

*Table 24: * = 90%, ** = 95%, ***=99%*
N = 100

Of those 9 respondents who use multiples, 6 of them answered which multiple they apply in their terminal valuation models, all 6 of them use EV/EBITDA to estimate TV, which is conform prior empirical research and suggested literature (Titman & Martin, 2012). 2 others state to use other methods besides EV/EBITDA too, one uses EV/sales and the other uses a P/E multiple next to EV/EBITDA.

Considering the differences among sub-groups, Table 25 provides an overview on how many of these sub-group valuators apply a specific terminal value model. The Gordon Growth model is actually the least used valuation model for private equity valuators, along with the conversion model. 4 private equity valuators estimate terminal value using multiples, as well as 5 of the private firm valuators. The public firm valuators in the sample do not use multiples. Based on the statistical tests (i.e. Fisher's exact and chi-square), it can be concluded that these differences among sub-groups are substantial and significant, the p-value of the Fisher exact test is with 0.003 significant at the 99% confidence interval, the chi-square test of independence is also significant at the 99% confidence interval with a p-value of 0.003.

N-users TV-model			
TV-model	*Private Equity*	*Private firm valuator*	*Public firm valuator*
Gordon Growth	2	51	0
Conversion	2	6	1
Multiples	4	5	0
Value-driver	5	31	0
Other TV	2	11	0

Table 25: N-users TV-models

The 13 other terminal value methods, coming from 11 private valuators and 2 private equity valuators, are divisible into 3 categories. The first category, in which 6 valuators are included, describes the fade rate method as described by Columbia business school adjunct professor David A. Holland (2018: 70-78). He published a new terminal value estimation method where a build-in fade rate is crucial to the future growth rates maintained in the terminal value calculation. He points to the DCF assumption that valuations are made on a "going concern" basis, which implies that firms generate cash flow perpetuities. As it is impossible to make estimations on cash flow infinitely far from the valuation period, he says, "analysts are forced to make forecast assumptions about the terminal period using critical yet simplistic metrics such as P/E or EV/EBITDA to estimate terminal values or to embed a perpetual stream of excess profitability and value creation in the terminal period". As I stated prior in the literature section, regression to the mean states that firms cannot outcompete the market indefinitely. Therefore, Holland proposes for mature firm valuation to implement a fade rate which decreases the gap between ROIC and the cost of equity over time, such that both overperforming and underperforming firm returns are adjusted to a normalized level over time.

"This fade driver is a critical valuation component because it controls the speed at which the return on capital converges toward the cost of capital. A fade rate of 100% brings about immediate convergence (i.e. the convergence model), and a fade rate of 0% specifies no fade and perpetual excess profitability (i.e. GGM). You can think of the fade driver as a profitability attenuator. The fade parameter does not alter the invested capital growth rate, g, which is assumed to be constant." Here it differs from the Gordon Growth model, in which one changes the growth rate over time. Albeit theoretical rather than practical, the assumption is that the firm is able to grow constantly over time, however its overperformance on invested capital (ROIC) fades over this period. The method of stepwise decreasing the growth rate is applied by one valuator.

The second category in other method for terminal value estimation is that they are not used at all, which is adopted by 4 of the valuators in the sample. Answers in this category range from "never used" to "sometimes used" and "none, based on the segment". Added to this is one valuator who values the terminal value based on a subjective judgment where the prognosis is extrapolated after which evaluation of the terminal value compared to the total value are based on risk and volatility of the specific industry. Such a subjective judgment is potentially dangerous as a terminal value is such a large part of a valuation, it is easy to create inconsistencies with severe outcomes.

The last category consists of the valuator who adopted the method of Bradley and Jarrell (2008: 67), who developed the "appropriate expression for the nominal growth rate in the presence of inflation", as well as a "correction factor that, when added to the (nominal) M&M WACC formula, yields a company's true nominal WACC in the face of inflation. This method is compatible for all growth rates even with zero-investment firms".

Summarising, valuators seem to make proper use of the theory on terminal value estimation. Multiples are avoided by most and recent studies are eagerly implemented in practice. Also they seem to make use of terminal value models that suit their line of work best, at least to some extent, as private equity valuators are more inclined with the value-driver model and private firm valuators with the Gordon Growth model. The differences among groups are noteworthy, especially because the terminal value is such a large part of a final valuation estimate.

4.2.5.2 Terminal value growth rate

When selecting a constant growth model, one should consider which growth rate to apply in their TV estimation. In 4.2.5.1 it became clear that 53 individuals used the Gordon Growth model as (one of) their TV estimation tool(s). Of these 53 individuals, 23 stated their preferred growth rate. It might be that the answer rate is lower because people feel that the growth rate is especially case specific or that they use stepwise growth rates in their calculations. The range of growth rates, as can be seen from Table 23, spans from 1% to 3%, with 2% as most frequent answers. This is slightly higher than the current 2020-prospected GDP rate of the Netherlands, which is calculated to be 1.46%. However, in recent years the GDP has been around 2% and it might be that this is where the 2% comes from.

N-users TV-model

Growth rate (TV)	*1.0%*	*1.25%*	*1.46% (IR)*	*1.5%*	*2.0%*	*3.0%*
Count	2	1	4	3	12	1

Table 26: Preferred growth rates
N = 23

4.2.6 Forecasting period

Theoretically it has been advised to forecast for as long as the data allows it, Koller et al. (2010) recommend a forecast period of 10 to 15 years and even longer for firms that seem to have high growth rates and therefore need more time to reach a mature stage. The last sentence is the crux of the theoretic advice, a valuator should value a firm until it has reached a steady state, however it is not always clear how valuators should make such forecasts. It might therefore be that valuators use a standard time frame in which they model the valuations towards a steady state. Another interesting aspect is that valuators are often provided with a forecasts (of revenue) by the management of the valuation object. These limitations might pressure valuators into using a specific forecasting period. Koller et al. (2010) warn that "using a short explicit forecast period, such as five years, typically results in a significant undervaluation of a company or require heroic long-term growth assumptions in the continuing value." An explicit forecast period longer than 15 years makes it in turn difficult to predict individual cash flows. Their solution is to split-up the sample in a detailed forecast for 5 to 7 years and a simplified forecast for the following years in the chosen explicit forecast period.

Prior literature found that that most practitioners use forecasting periods as short as 1 to 5 years in their valuations, due to the inherent uncertainty in estimating forecasting periods. The argument that inherent uncertainty limits their forecasting period selection is worrying, as the ideal methodology is to forecast until a steady state has occurred. Pinto et al. (2019) find that CFA member respondents used forecasts of on average 7.77 years, with a median of 5 years. It is expected my sample uses a similar timeframe (mu = 6-8 years) and not shorter, as it is expected that they are able to produce reliable forecasts for a medium- to longer period of time.

Table 27 shows that the actual preferred forecast period lies between 2-5 years, as the adoption rate of 2-5 years is significantly higher than the 6-8 years adoption rate at the 99% confidence interval. There are various possible explanations as to why valuators are implementing shorter forecast periods than expected. It might for example be that the valuators face uncertainty in their forecasts and are therefore unwilling to estimate more future cash flows, it might however also be that steady states are expected to be quicker occurring in the current financial times.

T-test forecasting period

FC period	*estimate*	*t-statistic*	*p-value*
2-5 years	0.68	-	-
0-1 year	0.00	-	-
6-8 years	0.25	-8.68	0.00***
9-12 years	0.07	-21.60	0.00***
>12 years	0.00	-	-

*Table 27: * = 90%, ** = 95%, ***=99%*
N = 76

Looking at the count differences between sub-groups, the Fisher's exact test (p-value 0.244) and the chi-square test of independence (p-value 0.125) do not yield significant p-values, indicating that the variables are seemingly not co-dependently related. This makes sense as the most common forecasting period for the subgroups is 2-5 years, and none of the sub-groups have observations for category 1 (0-1 year) or category 5 (>12 years).

N-users forecasting period

FC period	*Private Equity*	*Private firm valuator*	*Public firm valuator*
0-1 year	0	0	0
2-5 years	10	41	1
6-8 years	2	17	0
9-12 years	0	4	1
>12 years	0	0	0

Table 28: N-users Forecast period per sub-group

4.2.7 Adjustments

In this section I will analyse various premiums that theory suggests are added to a (privately held) firm valuation. I will test if the "No premium" option is significantly most chosen compared to options where there is a premium selected. Thereafter, I filter the "No premium" options out of the data set and calculate the mean premium size. In 4.2.8 I work out a final summation of the individual premiums to estimate a total "private firm discount". For all question I analyse whether the sub-groups have different tendencies and make different choices. I analyse this, again, based on counting data, using the Fisher's exact test and the chi-square test with Monte Carlo-simulated p-values for robustness. The first premium analysed is the small cap premium.

4.2.7.1 Small cap premium

In section 2.2.4 I mention the small cap premium and how it is sometimes applied on an entity level. Theoretically the small cap premium has been found to be around 3.82% (Damodaran, 2016). Empirical findings of Vydržel and Soukupová (2012) made clear that there are large difference in small cap appliance between sub-groups, with those that do in fact use a small cap discount, setting this between 1-3% most frequently. PE engages more often in leaving the small cap premium equal to zero, whereas independent financial advisors (private firm valuators) tend to apply it more often, as well as applying a higher discount percentage.

T-test small cap

Small cap	*estimate*	*t-statistic*	*p-value*
>6%	0.40	-	-
No small cap	0.15	-6.16	0.00***
0-1%	0.00	-	-
2-4%	0.19	-4.71	0.00***
5-6%	0.27	-2.59	0.01**

*Table 29: * = 90%, ** = 95%, ***=99%*
N = 75

Based on the results in Table 32, the most frequent category of small cap premium is the over 6% range with 40% adoption by the sample, followed by the 5-6% range (27%). The mean small cap premium, among those that do apply a small cap premium (N = 64), is 4.45%. This mean is estimated by taking the average value per category and timing it by its relative N-users (Table 30) and consider the sum of the categories. It seems that for Dutch privately held firms the small cap premium is similar to those in the Czech Republic and the US considering the studies of Vydržel and Soukupová (2012) and Damodaran (2016). Only 15% of the sample uses no small cap at all.

Almost as many private equity valuators do not apply a small cap premium as private firm valuators, although their sample size is much smaller. This seems to indicate that the findings are in-line with the findings of Vydržel and Soukupová (2012) regarding the different application forms of different sub-groups. The Fisher's exact test returns a p-value of 0.029, which is significant at the 95% confidence interval and supportive of the findings of earlier studies. Different sub-groups do indeed use different small cap premiums.

N-users Small caps

Small Cap	*Private Equity*	*Private firm valuator*	*Public firm valuator*
No small cap	5	6	0
0-1%	0	0	0
2-4%	2	11	1
5-6%	1	18	1
>6%	3	27	0

Table 30: N-users size variants small cap per sub-group

4.2.7.2 Marketability premium

As stated before, marketability and illiquidity are used interchangeably in practice, and both relate to the creation of liquid money forms by selling a firm (Pratt, 2009). As they somewhat relate to the same issue and they are used interchangeably in practice, I combine them in the marketability premium. Harjoto & Paglia (2010) find 'discounts that average 65-70% of EBITDA and Sales and exceed 80% in some sectors of the economy, based matching private company transactions with publicly traded

counterparts. Larger companies, those with positive net income, and firms with lower risk of financial distress exhibit lower DLOMs". They conclude that discount for lack of marketability is highly sector specific, where the largest discounts occur in information services.

Empirical evidence to the subject finds that on average the marketability discount is 31.3% (Petersen et al. (2006). It is important to note that if not carefully applied, part of this marketability discount is included in the small cap premium and/or the control premium. Table 31 presents the findings of multiple t-tests that test the adoption rates of each categorical value on the most frequent option "No marketability". Here it can be seen that in my sample there is quite a diverse range of values provided as applied marketability discount. Where 32% does not apply any marketability discount, 7% uses a discount over 30%, and 51% uses some marketability discount that lies between those. The most frequent answer is "No marketability" but the values ranigng from 0 to 30% are all around the 20% adoption rate, indicating a wide-dispersity in this aspect of valuations. The mean marketability applied by the sample is 10.58%. This is an estimate for the sample that uses a marketability premium, the observations that are "No marketability" are filtered from this sample. This mean is significantly lower than the mean found in other empirical studies, or as proposed in theoretical studies. It might be a demographic or geographic effect for Dutch private firms, or because valuators feel a marketability discount should not be applied in fundamental value analysis as it is seen as a price effect.

T-test marketability premium

Marketability	*estimate*	*t-statistic*	*p-value*
No marketability	0.32	-	-
0-10%	0.26	-1.06	0.292
11-20%	0.18	-3.04	0.00***
21-30%	0.17	-3.45	0.00***
>30%	0.07	-8.29	0.00***

*Table 31: * = 90%, ** = 95%, ***=99%*
N = 72

Comparing across groups one thing is quite clear, among both private equity valuators and private firm valuators there is quite a disagreement on how high this marketability premium should be. Only the public firm valuators agree on a similar marketability discount. This might be coincidental, or it might be that public firm valuators are better able to estimate marketability of firms, as they are usually working with highly marketabile firms, as public ones are. The Fischer's exact test result in an insignificant p-value of 0.327 and the Chi-square test returns a p-value of 0.191, both indicating no dependent relationship between the two variables. The range of marketability premiums used in valuations cannot be accounted for by valuator type alone.

N-users marketability premium

Marketability	*Private Equity*	*Private firm valuator*	*Public firm valuator*
No marketability	4	19	0
0-10%	1	18	0
11-20%	2	9	2
21-30%	2	10	0
>30%	1	4	0

Table 32: N-users various marketability premiums per sub-group

4.2.7.3 Controlling stake premium

As stated in the literature section, the control discount is often regarded before marketability as having full control or not has an impact on the probability and price a firm can be sold for in the future. Therefore, control has an effect on the marketability discount. Damodaran (2012), as mentioned in 2.2.4, states that the estimation of the control premium is highly case-specific, as it is fully dependent on the state of the valuation object at hand and the capabilities of the potential buyer. Real changes only impact the value of having control and thereby the premium worth paying. Worse firms have a higher control premium than well-run firms. Most private firms are sold for 100% of its shares, rather than a minority share. This means that a control premium should be included in the firm value unless it is valued with 'optimal' sub-components, such as target structures, industry average margins or optimistic growth percentages. One could argue that the control premium is not a fundamental value effect, but a price effect, however if the firm is worse run there is an objectively higher number of actions that would increase operational value, thereby making the control premium part of the fundamental value of a firm. Control is not always bounded to 51% of the shares either, if the buyer has a material say in the optimizable operations with a smaller stake, this is already worth a controlling stake premium.

Petersen et al. (2006) found their empirical study, that the control premium (i.e. if an investor can gain control over the firm and gain synergies from that) turned out to be 29.4% on average. This 20-30% premium range is something that more (also non-scientific) sources publish.

T-test controlling share premium

Control premium	*estimate*	*t-statistic*	*p-value*
No control prem	0.58	-	-
0-5%	0.07	-16.58	0.00***
6-10%	0.14	-10.50	0.00***
11-15%	0.09	-14.83	0.00***
>15%	0.13	-11.33	0.00***

*Table 33: * = 90%, ** = 95%, ***=99%*
N = 71

58% of the sample actually does not apply a controlling stake premium at, based on the figures of Table 33. It is by far the most selected option and it is rather contradicting earlier empirical findings and the proposed theory by Damodaran. Of those who do apply a controlling premium the 6-10% margin is most popular. However, this option is significantly (99% CI) lower than the "No controlling premium" option.

PE and private firm valuators tend to not apply a controlling share premium, although there is some dispersion among private firm valuators, as 9 out of 59 (15.25%) apply this premium at the highest option (>15%). The two public firm valuators both apply a controlling share premium, which may indicate that applying a controlling premium in public firm valuation is more common than in private firm valuation, although there are plenty of reasons to argue that in private firm valuation this controlling stake premium should still be applied. The statistical differences among sub-groups are somewhat inconclusive as the Fisher's exact test does not return a significant p-value (0.1711), whereas the chi-square test does return a significant p-value at the 90% confidence interval (0.058).

Of the 30 respondents (out of 71) who do use a controlling premium, the mean applied rate is 4.34%, which is significantly lower than the empirical findings of Petersen et al. (2006) and the common advised rates of 20-30%, which in itself is not worrying, since it is said before that these control premiums are highly case-specific. However, the dispersion among the private firm valuators might indicate that opinions in the market differ to a certain extent, and that the topic is reason for discussion as well as more research on when and how this premium can be best quantified.

N-users controlling share premium

Control premium	*Private Equity*	*Private firm valuator*	*Public firm valuator*
No control prem	8	33	0
0-5%	0	5	0
6-10%	1	7	2
11-15%	1	5	0
>15%	0	9	0

Table 34: N-users various controlling share premiums per sub-group

4.2.8 Premium estimation

I found significant evidence that the small cap premium is applied to valuations of privately held firms in the Netherlands. Contradicting theory, I found that a significant proportion of the sample does not use a marketability premium or a controlling stake premium, however for both premiums I find that there is disagreement on the application. It might be that those who do not apply a controlling stake or marketability premium, actually include this in the small cap premium. Another explanation could be that the premiums are subjectively and/or inconsistently applied rather than following literature. Question 33 of the survey asks respondents to choose from four options. The first option is to base premiums on scientific research, the second is a systematic system that is put in place to consistently apply premiums in different valuations, the third is on the notion of experience, the fourth is an "other" category, where respondents can fill out their own approach.

Theory describes how premiums tend to be subjectively applied and are not standardised measures, they require trade-offs regarding either situation-specific issues or personal preferences. Barker (1999) already found that valuators mostly explore subjective company-specific information, which is not formally fed back into a valuation model. Imam et al. (2008) also found that some of the valuators are allowing their own subjective judgement to over-ride the conclusions of any given valuation model. It is hypothesized that the most selected option is the experience option, which is the proxy for subjective application of the premiums to valuations.

T-test premium application

Prem. Applic.	*estimate*	*t-statistic*	*p-value*
Experience	0.49	-	-
Scientific	0.18	-6.63	0.00***
Systematic	0.25	-4.45	0.00***
Other approach	0.09	-11.46	0.00***

*Table 35: * = 90%, ** = 95%, ***=99%*
N = 68

As can be seen from the results in Table 35, indeed, the most used method is "experience", with an adoption rate of 49%, which is signifcantly higher than any other method (99% CI). For all sub-groups (i.e. private equity valuators, private firm valuators and public valuators), this is the most applied method of estimating premiums. Whereas, besides the "other approach", the scientific approach ranks lowest. This makes sense, since it is already confirmed that estimating premiums is highly case-specific. However, one could argue that a systematic methodology of estimating parts of a firm (f.e. using a scorecard approach to 'grade' various parts of a firm and combine these to an overall premium), could improve consistency among valuators and their sub-groups in average premium estimation. The Fisher's exact test and the chi-square test do not return significant p-values (0.222

and 0.285, respectively), indicating that there are no significiant differences between the sub-groups and preventing from stating that there is a dependent relationship between the variables 'valuator type' and 'premium appication methodology'. 6 valuators answered which "other approach" they use for estimation of premiums, 2 try to quantify the risk based on probability and impact, 3 state to use experience in combination with consultation among team members and case-specific knowledge. 1 mentions the BDO model (as described in the cost of equity estimation).

It should be noted that, again, among private firm valuators there is the largest dispersion regarding the preferred methodology, for example the systematic approach does have a higher adoption rate than for private equity or public firm valuators. It might be that among this sub-group there is more discussion on how to approach these types of issues in valuations.

N-users premium selection

Premium application	*Private Equity*	*Private firm valuator*	*Public firm valuator*
Scientific	1	11	0
Systematic	0	17	0
Experience	7	25	1
Other approach	0	6	0

Table 36: N-users premium estimation approach per sub-group

4.2.9 Average private firm premium

The quantification of the sum of applied premiums to a combined private firm premium is a hard task, as there is a lot of dispersion between groups and within-groups as to whether or not these premiums should be applied in the first place, and secondly how high these premiums should be. The finding that most of these premiums are applied using experience rather than a systematic or scientific approach, makes that these premiums are susceptible to inconsistency and human biases, which further toughens the idea to provide insights into a total private firm premium. However, Adams and Thornton (2009) found that "after controlling for other explanatory variables, the results indicate a statistically and economic significant private company discount of approximately 30 - 40%". This private company discount is a combination of both control and marketability premium. These percentages are in line with empirical data Pratt (2009) found based on court cases in the US. These percentages are derived by comparing public firm transactions that are comparable of private firm transactions and analyse the differences between them.

I find no significant evidence that marketability and control premiums are applied by a majority of the sample, however among those who do apply these premiums in some form I calculated their mean values. To estimate an overall private firm premium, I create a new object, after which I recode the values of the premiums (Q34, Q39, Q41) in hypothesis 15 to the mean values of the brackets selected by each respondent. In this calculation I set the mean score of the upper boundary, or option 5 in the survey (i.e. >X%) equal to X, meaning 6% for small cap, 30% for marketability and 15% for control. It might in reality that some valuators apply premiums that far exceed these boundaries, thereby increasing the total average private firm discount and steeping it more towards the percentages mentioned in literature. Thereafter, I create a new variable which sums these numerical values per row (per observation). This is the final adjustment percentage compared to the final value of a target

per respondent. On this variable a t-test is run, with mu equal to 0, to see if the average final adjustment percentage differs significantly from zero. The estimate is the average final adjustment percentage for the sample. The results of this t-test are presented in Table 37.

Added together the mean private firm discount amount to 20.80%, which is lower than the findings of Adam & Thornton (2009) and those of Pratt (2009). It could be that over the last 11 years these premiums have dropped significantly, it could also be that part of the marketability and controlling stake discounts are included in the small firm discount, as this is applied at a significantly higher rate than the proposed small firm discount. If it is assumed that part of the premiums for marketability and control are captured in the estimation of the small firm premium, then the average private firm discount is 21.40% compared to public firms. It appears to be somewhat lower than the findings of prior empirical studies, however this might be due to the boundaries set for the highest answering categories per individual premium.

Mean private firm discount

Sum discounts	*estimate*	*t-statistic*	*p-value*
$\hat{\mu}$	0.00	-	-
Mean Mark +Ctrl	0.208	14.819	0.00***
Mean SC + Mark + Ctrl	0.214	15.755	0.00***

*Table 37: * = 90%, ** = 95%, ***=99%*

4.2.10 Conclusion research question 2

The first section of research question 2 spans the application of the cost of capital, which is used in the traditional DCF method; FCFF. It covers two hypothesis, the first focusing on the flexibility of the WACC and the second focusing on the estimation of WACC weights. It was estimated that a variable WACC is applied more often than a constant WACC, however I found that the opposite was true. There are significant differences between the sub-groups as private firm valuators are more likely than private equity or public firm valuators to apply a variable WACC. Theoretically, a variable WACC is due to these flexible capital structures preferred over a constant WACC. Given this, a significant proportion of the valuators does not tend to adhere to theory.

Regarding the calculation of WACC weights, it is hypothesized that market value weights are equally likely to be applied as book value weights, as empirical studies found prior to this study. Theoretically, market weights are preferred. WACC weights are significantly more based on a target structure or market values than book values. All sub-groups tend to apply the theory on market versus book values well.

The cost of equity is estimation is considered next and spans three hypotheses: general methodology, risk-free rate derivation and beta estimation. The general cost of equity derivation (section 4.2.2.1) preferred by the valuators in the sample was hypothesized to be the build-up approach, because of the flaws in CAPM and its limited applicability to privately held firms, as well as being more transparent and systematic then an experience-based or subjective estimation. This hypothesis was found to be true at the 99% confidence interval, indicating that valuators apply theory well and are transparent in their cost of equity estimation. Between the sub-groups are significant differences, where the private

equity valuators prefer to use an estimate of cost of equity that allows them to determine to estimate their own returns if an investment is made (i.e. IRR).

The risk-free rate was estimated to be proxied on the 20-year Dutch treasury bond. However the 10-year Dutch bond is the preferred proxy of most of the sample (30%). 25% of the sample actually prefers another proxy than the options provided in the survey. Between sub-groups the differences are found to be insignificant. It appears that valuators believe in current times the risk-free rate is too volatile too choose the 20-year bond, as it is estimated by most that the current risk-free rate will only be relatively constant for the next 10 years.

For those who use some form of CAPM (22%), it is hypothesized that peer groups are the most preferred method to estimate the beta component, as proposed by Solnik (1974). From the survey responses, it is found that comparables and peer-groups (industry average) are equally likely to be used (i.e. 41%). These findings support the hypothesis.

55% of the sample applies the effective interest rate of the firm to estimate cost of debt, supporting the hypothesis. The sub-groups do not differ significantly in their preferences. Valuators thereby appear to adhere to literature closely. Other ways mentioned to estimate the cost of debt mostly circumvent market rate estimations, that are adjusted for valuation object specificities.

Literature describes how the marginal tax rate is the better tax rate to use in valuations. Valuators actually go against this advice and apply the effective tax rate more often than the marginal tax rate (35% to 23%, significant at 95% CI), a finding that is consistent between sub-groups. It appears that the valuators do not apply the literature on tax rate to their valuations.

Supporting evidence is found that the GGM is applied most (53% of the sample) to estimate TV, however also, the value-driver model is used by a significant portion (36%). This model depicts extra information regarding efficiency of the invested capital, which might be the reason as to why it is most popular among the private equity valuators. 6 valuators opted for a relatively new terminal valuation model published by Holland (2018). The sub-groups apply significantly different valuation models and private equity valuators are more likely to apply multiples to estimate terminal value with, which might be a risky procedure due to biases and case-specific risks. The terminal growth rate selected lies between 1 and 3%, with a most frequent option of 2.0%. This is slightly higher than the average 2020 Dutch interest-rate, however this might be rounding error as well. Recent years the GDP has been around 2%, which might be seen as a “normalized” level.

It is found that a shorter forecast period than hypothesized is preferred by 68% of the sample (2-5 years). The sub-groups all seem to prefer the 2-5 years forecast, and the difference are not statistically significant. Where literature prescribes to use a lengthier forecast period, in practice it appears that the forecast estimation is a rather difficult task.

Question 27 aims to find a qualitative reasoning why valuators deviate from theory in their application of DCF. 68 valuators answered this open question, their answers are divisible in 4 main categories. The most common answer is a growth forecast of the firm (50.0%). Secondly, the *risk profile of the cash flows* is hardest to acquire (14.71%). Thirdly, *relevant, and recent market information and comparables* (13.24%). Fourthly, the *value drivers* of the firm (11.76%).

It is hypothesized that the is small cap premium is 3%. However, the most applied premium is ">6%" (40% AR). The mean small cap applied to a valuation is 4.45%, based on the 64 valuators who apply a small cap, this is higher than the findings in other studies. On average the valuators are well able to translate the theory on the small cap premium into practice. Private equity valuators are significantly less likely to apply a small cap premium compared to private firm valuators, which might be a perspective related occurrence, because private equity is more likely to buy rather than sell.

Marketability discounts are hypothesised to be up to 70% of EBITDA and sales of a firm, and empirically found to be up to 31.3% of total firm value in European studies. On average the mean size of it is 10.58%, thereby being significantly lower than the percentages found in theoretical and empirical research. Table 32 shows that within-groups there is a sizable dispersion on the application of the marketability discount. Among groups there are no significant differences.

In recent studies empirical studies the control premium is found to be on average 29.4%. 58% of the sample does not include a control premium to the valuation of a firm, often arguing that a control premium is a price effect rather than a value effect. It appears opinions regarding this topic differ in geographical regions. Thee mean applied rate is only 4.34%. The difference among sub-groups are partially significant. The group of valuators who does apply a small cap premium of >6%, may consider these premiums intertwined rather than separately. It could be that part of the marketability discount is included in the small cap premium and/or the control premium.

It is hypothesised that these premiums are estimated based on experience. With 49% the experience-based approach is significantly more adopted than any other method. Second highest is the systematic approach. Among private firm valuators there does appear to be a dispersion. Although the case specificity makes estimating premiums a difficult task in valuation, the underperformance of a systematic approach may prevent valuators to consistently estimate premiums. It is hypothesised that the total private firm premium is between 30 and 40%, compared to a public firm. I find a significantly lower estimate of 21.40%. This maybe a cross-sectional time effect.

All in all, the valuators appear to score reasonably well regarding the translation of theory into practice, especially in calculating the WACC, the cost of equity, the cost of debt and terminal value the primary literature is adhered to well. When selecting tax rates, forecasts periods and estimating premiums the sample deviates from prior empirical and theoretical literature. The valuators appear to select methods and calculations that suit their valuation purpose. Private equity valuators tend to estimate the cost of equity using the IRR method, which is not prescribed by literature. The flexibility of the WACC in the forecast period, the cost of equity estimation model, the terminal valuation model and the estimation of the small cap premium appear to be affected by the type of valuator is valuing the object. Among private firm valuators there is a higher rate of disagreement within the sub-group, this might be because private firm valuators have a larger range of valuation purposes or have more educational differences.

4.3 Explorative factor analysis

Conducting a factor analysis adds to the multivariate regression in RQ 3 on top of the internal reliability measure of the items, because factor loadings show the extent to which the individual items contribute to the overall factor. This makes it possible to create an individually weighted factor instead of being only able to base this on an 'equal weights' assumption.

Before engaging into the factor analysis, the first step is to create a correlation matrix (R-matrix), as depicted in Table 38. This correlation matrix shows the "null test", meaning that it is unaltered and straight from the survey results. This matrix shows that Q18#1_4 and Q18#1_6 are only weakly correlated with Q18#1_8, which is the direct information asymmetry proxy item, as well as the other Q18 items. As they are weakly correlated these are terminated from the factor analysis, resulting the correlation matrix in Table 39. This matrix shows that some variables of Q18 and Q19 are somewhat related to each other, which makes oblique rotation over orthogonal rotation a necessity in the factor analysis.

Next, I test the suitability of the data for EFA by using three methods: the Kaiser-Meyer-Olkin (KMO) index, the Bartlett's test of Sphericity and the determinant test of Field (2000). I found a KMO index of 0.83 across all variables indicating a meritorious score, indicating that the data is suited for factor analysis. The Bartlett's test of Sphericity also provides positive results with a p-value of 0.000. The determinant test of Field tests the correlation between two variables to the extent that one explains the effect of the other. The determinant of the R-matrix should be greater than 0.00001 (Field, 2013: 647). I find a determinant of 0.0014, which is above the required threshold, indicating that multicollinearity is a priori not a problem. Also, none of the variables in either correlation matrix are 'too highly' correlated with each other (i.e. r > .9), which is also an indicator of multicollinearity.

As all a priori tests indicate that the variables are well suited for factor analysis I continue the common factor analysis. The next step is to analyse how many factors are appropriate to include into the factor analysis. The "screeplot" method, as depicted by figure 4, shows a levelling of the Eigenvalues at N-factor 3 and 5. Indicating a range of 2-4 factors that could be suitable for the factor analysis. Based on the screeplot, the underlying literature and the threshold for Eigenvalues (>1.0), it is reasonable to consider two factors in the model.

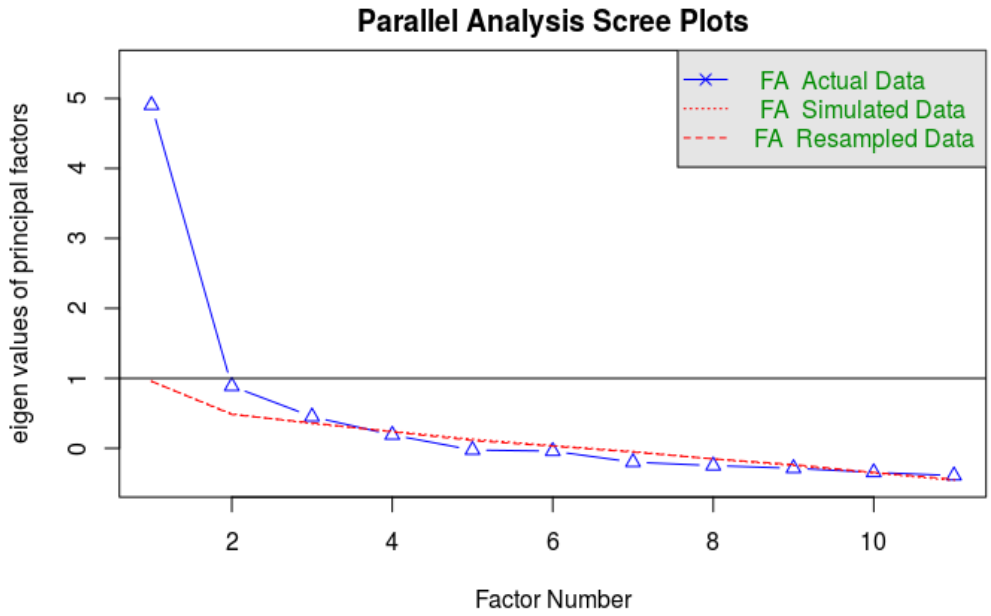


Figure 4: Scree plot factor analysis

Correlation matrix items Q18 and Q19

	Q18#1_1	*Q18#1_2*	*Q18#1_3*	*Q18#1_4*	*Q18#1_5*	*Q18#1_6*	*Q18#1_7*	*Q18#1_8*	*Q19#1_1*	*Q19#1_2*	*Q19#1_3*	*Q19#1_4*	*Q19#1_5*
Q18#1_1		0.764	0.524	0.336	0.491	0.336	0.444	0.522	0.375	0.290	0.261	0.379	0.244
Q18#1_2	0.764		0.520	0.302	0.493	0.303	0.477	0.472	0.499	0.445	0.333	0.562	0.292
Q18#1_3	0.524	0.520		0.690	0.532	0.314	0.447	0.496	0.331	0.378	0.293	0.291	0.470
Q18#1_4	0.336	0.302	0.690		0.412	0.164	0.325	0.346	0.304	0.376	0.343	0.327	0.416
Q18#1_5	0.491	0.493	0.532	0.412		0.420	0.362	0.456	0.454	0.442	0.467	0.250	0.396
Q18#1_6	0.336	0.303	0.314	0.164	0.420		0.297	0.378	0.473	0.318	0.285	0.163	0.282
Q18#1_7	0.444	0.477	0.447	0.325	0.362	0.297		0.633	0.357	0.343	0.351	0.318	0.339
Q18#1_8	0.522	0.472	0.496	0.346	0.456	0.378	0.633		0.326	0.308	0.444	0.366	0.528
Q19#1_1	0.375	0.499	0.331	0.304	0.454	0.473	0.357	0.326		0.740	0.616	0.629	0.487
Q19#1_2	0.290	0.445	0.378	0.376	0.442	0.318	0.343	0.308	0.740		0.627	0.499	0.607
Q19#1_3	0.261	0.333	0.293	0.343	0.467	0.285	0.351	0.444	0.616	0.627		0.545	0.711
Q19#1_4	0.379	0.562	0.291	0.327	0.250	0.163	0.318	0.366	0.629	0.499	0.545		0.399
Q19#1_5	0.244	0.292	0.470	0.416	0.396	0.282	0.339	0.528	0.487	0.607	0.711	0.399	

Computed correlation used Pearson-method with listwise-deletion.

Table 38: Correlation matrix (null test)

Correlation matrix items Q18 and Q19

	Q18#1_1	*Q18#1_2*	*Q18#1_3*	*Q18#1_5*	*Q18#1_7*	*Q18#1_8*	*Q19#1_1*	*Q19#1_2*	*Q19#1_3*	*Q19#1_4*	*Q19#1_5*
Q18#1_1		0.759	0.502	0.509	0.432	0.508	0.383	0.282	0.289	0.386	0.259
Q18#1_2	0.759		0.508	0.499	0.479	0.471	0.505	0.443	0.341	0.564	0.285
Q18#1_3	0.502	0.508		0.517	0.422	0.489	0.312	0.375	0.285	0.259	0.473
Q18#1_5	0.509	0.499	0.517		0.361	0.451	0.461	0.436	0.481	0.263	0.396
Q18#1_7	0.432	0.479	0.422	0.361		0.630	0.369	0.340	0.346	0.340	0.300
Q18#1_8	0.508	0.471	0.489	0.451	0.630		0.327	0.308	0.439	0.364	0.509
Q19#1_1	0.383	0.505	0.312	0.461	0.369	0.327		0.733	0.617	0.639	0.460
Q19#1_2	0.282	0.443	0.375	0.436	0.340	0.308	0.733		0.619	0.488	0.591
Q19#1_3	0.289	0.341	0.285	0.481	0.346	0.439	0.617	0.619		0.541	0.704
Q19#1_4	0.386	0.564	0.259	0.263	0.340	0.364	0.639	0.488	0.541		0.356
Q19#1_5	0.259	0.285	0.473	0.396	0.300	0.509	0.460	0.591	0.704	0.356	

Computed correlation used Pearson-method with listwise-deletion.

Table 39: Correlation matrix (alternative test)

The factor analysis is both run without and with “oblimin” rotation, see Tables 40 and 41. Here, the purpose of rotation is immediately portrayed, as the factor analysis without rotation leads to very inconclusive results, whereas the oblique-rotated factor analysis shows factor loadings that are clearly separating the two factors, as well as showing that the items of the respective questions indeed load high on their intended factors. As a rule of thumb, loadings with a cut-off of 0.30 are considered as influential to a factor and should be concluded. It can be observed that not only do the items score well-above this threshold, the items of the other question do not load on the other factor with a score of 0.30. The correlation between the two factors is thereby effectively handled by the oblique rotation approach.

Next, I present some measures on the goodness-of-fit of the model. These measures help validate the model that is just created. The first estimate is the root means square of residuals (RMSR), this is the standard deviation of the residuals (prediction errors) of the model. These residuals are a measure of how far from the regression line data points are. It shows the concentration of the data. The RMSR is 0.07, which is indicating a reasonably good model fit, as it should be ‘close’ to zero. The harmonic Chi Square is equal to 4.13 with a p-value of 0.096, which is higher than the 0.05 threshold, indicating that the two factors are considered independent from each other. The chi-square test however usually applies to samples where N > 150 observations, which is not the case in my same (i.e. N = 80). The last measures of model fit are the Tucker Lewis Index and the RSMEA. These are both underperforming with scores of 0.76 (threshold is 0.90) and 0.151 (threshold is 0.005) at the 90% CI, however this is probably because the sample size is smaller than 100, thereby decreasing the statistical power, despite all communalities being well-above 0.6, which according to Field (2013: 647) could make relatively small samples (less than 100) perfectly adequate. Untabulated results, using three- and four-factor models, show no better results than the results. Considering the literature, the internal reliability and the partial evidence of the factor analysis, it is reasonable to consider these two factors as underlying dimensions of the patterns in importance estimation of the items in questions 18 and 19.

Using the factor loadings of the tables on the right, I create factor scores for all respondents. Below some descriptive statistics regarding the new variables are presented, as well as a table summarising the findings of an ANOVA comparing factor means across groups. From Table 44 it can be observed that the mean factors differ across groups private firm valuators actually have a lower mean score for both client orientation and information asymmetry compared to private equity valuators. However, Table 45 depicts the results of two ANOVAs comparing the means for the factors using a Tukey-HSD posterior test, to visualize the actual differences amongst the individual factor levels of valuator type, as well as the overall F-test. I find that both client orientation and information asymmetries have very insignificant mean

Factor Analysis		
	Factor 1	Factor 2
Q18#1_1	0.67	0.49
Q18#1_2	0.74	0.35
Q18#1_3	0.61	0.24
Q18#1_5	0.65	0.11
Q18#1_7	0.59	0.21
Q18#1_8	0.66	0.21
Q19#1_1	0.74	-0.29
Q19#1_2	0.72	-0.38
Q19#1_3	0.73	-0.43
Q19#1_4	0.63	-0.13
Q19#1_5	0.66	-0.29

Table 40: FA "none" rotation

Factor Analysis		
	Factor 1	Factor 2
Q18#1_1	-0.13	0.90
Q18#1 2	0.06	0.79
Q18#1_3	0.10	0.60
Q18#1_5	0.26	0.47
Q18#1_7	0.12	0.55
Q18#1_8	0.16	0.59
Q19#1_1	0.74	0.09
Q19#1_2	0.82	-0.01
Q19#1_3	0.88	-0.06
Q19#1_4	0.50	0.21
Q19#1_5	0.69	0.05

Table 41: FA "oblimin" rotation

differences among the groups. It appears that these factors do not help identify valuation method selection across groups. However, they can still be analysed with their regards to valuation method selection for the sample as a whole.

Descriptives Information Asymmetry

Summary statistics Information Asymmetry	*Minimum*	*Maximum*	*Mean*	*Std Deviation*	*Variance*	*Count*
Industry	1.00	5.00	3.77	0.97	0.95	88
YOY Growth	1.00	5.00	3.90	0.98	0.96	88
Reporting quality	1.00	5.00	3.39	0.91	0.83	88
Reporting quantity	1.00	5.00	3.07	0.85	0.73	82
Firm size	1.00	5.00	3.32	1.01	1.01	88
Ownership structure (public or private)	1.00	5.00	3.48	1.02	1.03	87
Tangibility of the assets	1.00	5.00	2.98	0.94	0.89	88
Information asymmetries	1.00	5.00	3.22	0.85	0.72	83
Factor Information Asymmetry	3.63	18.17	11.65	3.15	9.93	78

Table 42: Descriptives Information Asymmetry

Descriptives Client Orientation

Summary statistics Client orientation	*Minimum*	*Maximum*	*Mean*	*Std Deviation*	*Variance*	*Count*
Transaction relatedness	1.00	5.00	3.34	1.03	1.05	87
Buy- or sell-side in transaction	1.00	5.00	3.08	1.12	1.25	87
Intuition of the story towards the client	1.00	5.00	3.18	1.01	1.03	82
Valuation purpose	1.00	5.00	3.78	0.96	0.91	81
Client understanding valuation	1.00	5.00	2.91	1.06	1.13	82
Client orientation	3.91	19.54	13.60	2.95	8.70	78

Table 43: Descriptives Client Orientation

Means factors across groups

Valuator type	*mean(client_or)*	*mean(info_asym)*
PE	12.44	13.86
Public val	14.54	15.08
Private val	11.45	13.52

Table 44

ANOVA across groups

Valuator type	*p-values (CO)*	*p-values (info asym)*
Public-PE	0.918	0.790
Private-PE	0.926	0.555
Private-Public	0.863	0.597
Pr(>F)	0.824	0.387

Table 45

4.4 Method predictors

Section 4.4 deals with the third research question: *"Why are these valuation models selected?"*, as described in section 3.3 of this thesis. It analyses based on logistic regressions as well as multinomial logistic regressions if valuator type (divided in three sub-constructs) determines valuation method selection and DCF-component selection. For the valuation methods I focus on DCF and multiples. To assess these I use the dummy variable for DCF (see section 4.1.1) and create a new variable called 'multiples', which is equal to one if either or both `market multiple` and `transaction multiple` is equal to one and zero otherwise. The results of the 9 models tested for both DCF and multiples are presented in Tables 48 and 49.

The DCF-components of interest are those that are found to be significant across groups as determined in research question 2 (section 4.2). These are cost of equity selection, WACC flexibility, and small cap estimation. These three are analysed using the multinomial logistic regression (as these have more than two categories). The findings of the models regarding DCF-components are presented in Tables 50-52. For these MNLs the Irrelevant Alternative (IAA) assumption is considered and either the question includes an "other" category, or it is collectively exhaustive, thereby making the existence of alternatives impossible.

DCF VIF matrix

Model	*Q1*	*Q3*	*Q4*	*Q5*	*Q6*	*Q16*	*client_or*	*info_asym*
Model 4		1.02	1.23	1.35	1.40	1.13		
Model 5		1.17	1.15	1.33	1.38	1.22	1.12	
Model 6		1.19	1.16	1.34	1.41	1.22		1.12
Model 7		1.21	1.15	1.35	1.40	1.26	1.36	1.44
Model 8	1.32	1.31	1.17	1.29	1.39	1.16	1.29	1.39
Model 9	1.01						1.21	1.21

Table 46: DCF Multicollinearity test

Multiples VIF matrix

Model	*Q1*	*Q3*	*Q4*	*Q5*	*Q6*	*Q16*	*client_or*	*info_asym*
Model 4		1.04	1.03	1.21	1.20	1.01		
Model 5		1.09	1.08	1.18	1.21	1.07		1.06
Model 6		1.06	1.06	1.18	1.19	1.04	1.04	
Model 7		1.13	1.09	1.22	1.23	1.10	2.00	2.02
Model 8	4.69	1.23	5.23	1.21	1.41	1.16	2.08	1.96
Model 9	1.01						1.54	1.54

Table 47: Multiples Multicollinearity test

In this section I will first go through the three sub-constructs: Information asymmetry, client orientation valuator characteristics and then proceed with the main construct `valuator type`. I test the formulas with both the DCF dummy as dependent variable and the multiples dummy as dependent variable. For each of these tests I provide an overview of the assumptions. After the valuation methodology I proceed with the DCF-components as mentioned before.

DCF selection information asymmetry factor (coefficients)

A) IV	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5 Bayesian*	*Model 6 Bayesian*	*Model 7 Bayesian*	*Model 8 Bayesian*	*Model 9 Bayesian*
Intercept	2.986	4.162*	-0.261	11.581	6.159	5.663	6.952	7.541	1.817
Q1			1.479**					1.818*	1.427**
Q3				0.281	-0.332	-0.457	-0.363	-0.429	
Q4				-0.350	3.027**	3.013**	3.021**	0.495	
Q5				-0.142	0.006	-0.046	-0.006	-0.058	
Q6	0.023			0.269	-0.190	-0.201	-0.187	-0.252	
Q13	0.759								
Q16				-2.663**	-0.887	-0.787	-0.942	-0.744	
Info asym	-0.262				-0.170		-0.146	-0.140	0.017
Client or		-0.110				-0.109	-0.056	-0.087	-0.176

Table 48: DCF selection logistic regression overview
** = 90%, ** = 95%, ***=99%*

Multiple selection information asymmetry factor (coefficients)

B) IV	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*	*Model 8*	*Model 9*
Intercept	-1.807	-0.173*	2.513**	5.418*	3.605	6.114	4.357	4.731	0.100
Q1			-0.730*					-1.009	-0.752*
Q3				-0.715	-0.942	-0.856	-1.032*	-0.908	
Q4				0.126	0.084	0.055	0.052	1.046	
Q5				0.039	-0.070	-0.041	-0.095	-0.044	
Q6	-0.295			-0.317	-0.378	-0.334	-0.340	-0.282	
Q13	-0.040								
Q16				-0.146	-0.092	-0.279	-0.001	-0.135	
Info asym	0.252*				0.251**		0.360**	0.330**	0.253**
Client or		0.060				0.070	-0.171	-0.142	-0.081

Table 49: Multiple selection logistic regression overview
** = 90%, ** = 95%, ***=99%*

4.4.1 Valuation method selection

Models 1 to 4 show the individual factors and their correlation to the dependent variable. In model 1 the effect of information asymmetry is shown using a standard logistic regression. Information asymmetry is not found to have a significant effect on the usage of DCF for these valuators. The coefficient is -0.101, which indicates a negative effect of 10.10% between the factor and the log-odds of the dependent variable, however it is not statistically significant.

The first model of the multiples (Table 49) depicts the same formula, but considers the outcome variable "multiples", meaning either or both transaction and market multiples are applied by the valuator. Here it is found that the information asymmetry factor is significant at the 95% confidence interval (p-value 0.022). The coefficient predicts a 20.5% change in log-odds of the outcome if the information asymmetry increases with one unit. In probabilities the base rate adoption of multiples is $\frac{e^{(-1.807)}}{(1+ e^{(-1.807)}} = 14.10\%$, and for each unit increase in information asymmetry this probability of using multiples increases with 56.27%, clearly showing the importance of information asymmetry on the use of multiples. The observed Information asymmetry is not found to be affecting the choice of using DCF, however it is associated with the increased likelihood of selecting a multiple approach in the valuations.

The second model shows the logistic regression output with the client orientation factor as independent variable. The intercept is statistically significant for both the DCF and multiple models, being positive for the DCF model and negative in the multiple model. This indicates that if all predictors are zero, the application of DCF and multiples is statistically different from zero. This is once again proof that DCF is preferred over multiples. In the DCF model the intercept is -0.173 indicating that if client orientation is zero, the odds of using DCF is $e^{(-0.173)} = 0.841$ or about 45.68%. The regressed factor is however not significant at any traditional level. The coefficient signs of predictor in the DCF model and the multiples model are contrasting each other, indicating again the negative relationship between DCF and multiples usage.

The third model analyses the valuator characteristics that are hypothesized to have an effect. Pinto et al. (2019: 220) found no effects for the personal characteristics, "these personal variables considered were years worked in equity analysis, highest academic degree earned, accounting designations, years holding the CFA charter, and charter versus non-charter status". Four of the characteristics are not found to be significant very much in line with the findings of Pinto et al. (2019). However, I do find that Q16 (Firm has a standard valuation technique) is strongly negatively related to the use of DCF (95% confidence interval) with a p-value of 0.043. The linearity of Q16 with the log-odds of the outcome is strong, indicating a good fit of the model. The coefficient of -2.663 indicates that if there is a more standardized way of working in the firm of the valuator the valuator is less likely to be using DCF. The base DCF adoption rate of the model is 99.5% clearly indicating the very high usage of DCF for the sample. However, for each increase of Q16 the probability of using DCF decreases 6.52% points.

Model 4 shows the effect of Q1 (i.e. valuator type) on the use of DCF and multiples, respectively. I find that valuator type is strongly positively related to the use of DCF, which is in line with the findings of 4.1.1 that private firm valuators apply DCF more often than private equity valuators. The positive coefficient of 1.479 is significant at the 95% confidence interval (p-value 0.002), indicating that valuator type 3 (private firm valuator) is more associated with DCF usage than valuator type 1 (private equity valuator). Regarding the use of multiples I, too, find a significant relationship with Q1 and the dependent variable, but this is a negative one. The coefficient (i.e. -0.730) indicates how private firm valuators apply multiples significantly less than private equity valuators.

Model 5 to 8 are robustness test for models 1 to 4 and test various combinations of constructs, to see if the significant relationships change or hold. Model 5, 6 and 7 of the DCF side show something interesting, where Q16 first was found to be significant the inclusion of the factors causes this significance to be completely captured by Q4, which is the 'extra financial titles' variable. Q4 is

significant at the 95% confidence interval level for these three models. Indicating a higher use of DCF by those who have a financial title. The coefficients are large ranging from 3.013 to 3.027. The factors client orientation and information asymmetry are again found to be insignificantly impacting the dependent variable DCF usage. In logistic regression 5-7 where multiples usage is the dependent variable the effects also change to some extent. The information asymmetry coefficient estimate increases in size, indicating a stronger effect on the dependent variable and remains highly statistically significant (95% CI). The client orientation factor is again not found to be significant and even flips signs when information asymmetry is included in the model. In model 7 a significant negative effect is found for Q3, which is the education variable. The coefficient of -1.032, which is significant at the 90% confidence level, indicates that with one-unit increase of education the log-odds of the outcome decrease with an economically significant 103.2%. Higher education apparently leads to a lower use of multiples.

Model 8 includes all variables, meaning the 3 sub-constructs and the main construct type of valuator. In the logistic regression with the DCF usage as outcome variable the significance of Q4 (financial titles) is completely absorbed by the valuator type variable and is therefore no longer significant. Type of valuator is significantly related to DCF usage and captures both the effects of Q16 (standardized method) and Q4 (financial titles). It has a coefficient estimate of 1.818, which is significant at the 90% confidence interval. Model 8 with multiples as dependent variable shows again a very strong correlation between information asymmetry and the use of multiples (p-value 0.031). The valuator type variable is not found to be significant with a p-value of 0.303. However, it is partially affected by the valuator characteristics variables Q3-Q16, because in model 9 it is significant again with a coefficient of -0.752 (p-value 0.073). Also for the DCF, model 9 shows how the valuator characteristics capture part of the explanatory power of valuator type, as valuator type is now statistically stronger related to the dependent variable. It is significant at the 95% confidence interval and has a coefficient estimate of 1.427. Both client orientation and information asymmetry seem to be insignificant in the choice of DCF.

4.4.2 DCF components

In this section I analyse the same independent variables as described in 4.4.1, however I analyse their effects on 3 components of DCF that were found significantly different among the sub-groups. The aim is to find why these differences occur. The three components analysed are: cost of equity, WACC flexibility and the small cap premium estimation. These are all analysed using the multinomial logistic regression, which is an extended model compared to the logistic regression in that it allows the dependent variable to be a non-numerical (i.e. nominal) factor, whilst allowing the IVs to be numeric or categorical (including dummies).

Tables 50, 51 and 52 show the results of the multinomial logistic (MNL) regressions conducted on the cost of equity, WACC flexibility and small cap premium. The MNLs are executed one by one due to a limitation in the sample size (N = 69), this prevents me from testing the significant relations on robustness. However the individual MNLs still provide a reasonable interpretability on the individual effects of the variables.

The most frequent applied cost of equity derivation approach is the 'build-up' approach, which is therefore selected as reference point of the MNL. In Table 50 the IVs and the outcome variable's level can be seen. The coefficients are marked with one or multiple asterisks, signalling the significance of the relationship where the IV level affects the log-odds of the outcomes level relative to the reference point (i.e. build-up). A unit increase in Q1 (differing valuator type) is associated with the increase in the log-odds of using an 'other approach' in estimating the cost of equity relative to using build-up approach, in the amount of 3.290. This effect is significant at the 99% confidence interval. A unit increase in Q3 (education) is associated with the decrease in the log-odds of using IRR relative to the build-up approach, in the amount -1.397, which is significant at the 90% confidence interval. A one-unit increase in Q5 (experience) is associated with a decrease of 0.858 in the log-odds of 'other' approaches compared to the build-up methodology. A unit increase in Q6 (age) is associated with the decreases of the log-odds of CAPM, IRR and the experience approach, relative to the build-up approach. These are all effects, significant at the 90% confidence interval. Q16 (standard valuation approach) is significantly negatively related to the log-odds of another approach of estimating the cost of equity relative to the build-up approach. A unit increase in client orientation is found to be significantly and positively related to the log-odds of IRR relative to the build-up approach. The coefficient size is 0.433 and significant at the 90% confidence interval.

Cost of equity MNL

IV/level	*CAPM*	*MCAPM*	*IRR*	*Experience*	*Other*
Q1	-7.279	-6.931	-8.621	-15.617	3.290***
Q3	-0.791	0.327	-1.397*	2.133	-0.265
Q5	0.518	0.054	0.764	-0.478	-0.858*
Q6	-0.713*	-0.763*	-0.894	-1.525*	-0.602
Q16	0.509	0.007	0.040	0.352	-1.300*
Client_or	0.074	-0.143	0.433*	-0.083	0.040
Info asym	-0.041	-0.151	0.374	0.031	-0.077

Table 50: Cost of equity MNL overview
** = 90%, ** = 95%, ***=99%*

WACC flexibility MNL

IV/level	*Variable*	*Dependable*	*No WACC*
Q1	7.659	7.532	0.959**
Q3	-0.221	-.780	0.273
Q5	-1.250***	0.001	-0.052
Q6	0.871*	0.962*	1.324***
Q16	0.180	0.221	0.288
Client_or	0.233	0.085	0.083
Info asym	-0.164	-0.093	0.022

Table 51: WACC flexibility MNL overview
** = 90%, ** = 95%, ***=99%*

WACC flexibility, as depicted in Table 51, has the reference point "1", which is the constant WACC methodology, as this is the most frequently used approach in the sample, besides "No WACC". I chose constant WACC as reference point, as it makes the comparison with variable WACC more intuitive. Q1 is positively related to the log-odds of "No WACC" relative to a constant WACC, indicating the strong preference of private valuators with the APV methodology instead of the FCFF variant. Q5 (experience) is strongly negatively related to the log-odds of variable WACC versus constant WACC. The coefficient is -1.250 and is significant at the 99% confidence interval. Q6 is, similarly too the cost of equity MNL, significantly related to multiple log-odds relative to the constant WACC approach. It is significantly and positively related to the log-odds of "No WACC", but also to those of variable WACC and a dependable WACC. This mostly indicates that the older valuators of the sample are least likely to use a constant WACC approach relative to all other approaches.

The small cap premium only has two variables that are significantly related to the log-odds of ">6% small cap", which is the most frequent adopted small cap premium by the sample (40% AR). Q1 is

negatively related to the log-odds of no-small cap relative to ">6% small cap". The coefficient is -0.850 and significant at the 90% confidence interval. A unit increase in Q3 (education) is negatively related to the log-odds of using no small cap, relative to those of ">6% small cap". The amount is -2.062 and is significant at the 95% confidence interval.

Small Cap premium MNL			
IV/level	*None*	*2-4%*	*5-6%*
Q1	-0.850*	0.124	0.184
Q3	-2.062**	-0.356	-1.089
Q5	0.009	-0.351	0.028
Q6	0.096	-0.456	0.384
Q16	0.474	-0.274	0.010
Client_or	0.041	-0.028	-0.032
Info asym	-0.036	0.023	-0.134

Table 52: Small cap premium MNL overview
** = 90%, ** = 95%, ***=99%*

4.4.3 Conclusion research question 3

In section 4.3.1 I find significant effects for various independent variables on the use of DCF, I find that a standardized way of working is negatively related to DCF usage, whereas having an extra financial title is positively related to the use of DCF. Information asymmetry and client orientation are found to be insignificantly related to the dependent variable.

A one-unit increase in the standardized way of working variable is associated with a 7%-point drop in the adoption rate of DCF, which has a base adoption rate of nearly 99.5% for the sample if all predictor were equal to zero. However, I find that the findings of DCF model 3 are not robust, as the significance of Q16 drops rather quickly when other variables are included. Also, in multiples model 3 there is no significance observed for variable Q16. It appears these findings are merely a fluke in the data.

Q4 (i.e. having an extra financial title) is significantly and positively related to the adoption of DCF, congruent with the hypothesis that applying DCF in an appropriate fashion requires more than a graduate-level education, as it requires a lot of skill and knowledge. Especially forecasting is estimated to be a difficult task. It is found that Q4 adds 95.4% to a base rate DCF adoption of already 99.7% by the sample. It is found that Q4's explanatory power is captured by the valuator type variable (Q1) in model 8. Q1 and Q4 are highly correlated with each other as the private firm valuators are selected based on their membership at the NIRV, thereby making it that this valuator type all possesses an extra financial title. Where the base rate DCF adoption in model 8 is 99.9% if all predictors are zero, it is found that private firm valuators apply DCF even more compared to private equity valuators.

The multiples adoption on average has a base adoption rate that is lower than the DCF methodology as is in-line with the findings of 4.1.1. Client orientation is found to be insignificantly related to multiples adoption and its sign flips, whereas it remained consistently negative for the DCF adoption. It appears that client orientation, for example in a transaction-related valuation, makes valuators less inclined to use a DCF approach (although not significantly), whereas multiples are fully unrelated to this factor. Information asymmetry is found to be significantly, positively, and robust related to the use of multiples. Valuators tend to use more multiples in valuation when the information asymmetry increases. Information asymmetry therefore makes a clear impact on the selection of valuation method by valuators. It is hypothesized that certain valuator types deal consistently with more information asymmetry than others. Therefore, it is expected that the explanatory power of information asymmetry is captured by the valuator type variable (Q1). However, in models 8 and 9 it can be seen that Q1's explanatory power is captured so much by valuator characteristics that it is not found to be significant (model 8), whereas it is significant in model 9 when the valuator characteristics are excluded. The information asymmetry factor is in both models significant and therefore robust. Apparently, the levels of information asymmetry are not consistent for different valuator types to such an extent that the valuator type explains all of the valuation method selection.

Section 4.4.2 highlighted the effects of individual variables on the log-odds of using different approaches to estimate cost of equity, applying WACC flexibility, and estimating the small cap premium compared to the most frequently selected option. The cost of equity is most frequently estimated using the build-up approach, thereby being the reference point. Valuator type (Q1) is found to be positively and significantly related to the log-odds of "other" relative to the build-up approach. This is interpreted as an increase of 96% of the base rate usage of an "other" approach relative to its base rate. This difference is however not economical as the base rate of "other" relative to the build-up approach is only 0.005% so for private firm valuators the probability of using "other" relative to the build-up approach is 0.0098%. Q3 (education) is associated with a 3% decrease of using internal rate of return. Q6 is having both statistical and material effect on the use of CAPM, MCAPM, and experience-based cost of equity estimation relative to the build-up approach. With base log-odds ranging from 1.210 (MCAPM) to 1.838 (Experience) the probabilities of using these approaches relative to the probabilities of the build-up approach, significantly change as the coefficients are ranging from -0.713 (CAPM) to -1.525 (Experience). An increase of age is therefore clearly indicating a decrease in the use of CAPM, MCAPM and experience-based cost of equity estimation. It might be that the older valuators are less inclined to use any other approach relative to build-up due to their experience. However, the experience argument fails to deliver as Q5 (experience) is not found to significantly impact the cost of equity derivation. Further untabulated tests show that Q5 and Q6 are not highly correlated as one would expect, it might therefore be that the scales of Q5 and Q6 are not well-enough aligned. Q16 is also found to be significantly related to using less "other" cost of equity derivation approaches. This seems sensical as a standardized approach is more likely to be based on a more common approach than a highly specific one. With the log-odds of the base rate and the coefficient being nearly perfect opposites (1.282 versus -1.300), this variable makes both a statistical and economic impact on the probability of using an "other" approach relative to the use of build-up. Of the two main factors only client orientation is found to have a material impact on the cost of equity derivation. With a significance at the 90% confidence level (p-value 0.082), the coefficient of client orientation is positively related to the log-odds of IRR relative to the build-up approach. The economic impact is however only slim, with a base rate of -99% a unit-increase of client orientation changes the relative use of IRR compared to build-up with 0.2%.

In the WACC flexibility MNL overview, the reference point is a constant WACC. Valuator type seems to have an effect on the use of a constant or variable WACC. Q5 (experience) is significantly and negatively related to the use of a variable WACC relative to applying a constant one. With a base rate of 94% of selecting a constant WACC with a zero value for Q5, the probability of selecting a constant WACC compared to a variable WACC drops with -22.26%. Experience apparently is associated with more use of a constant WACC relative to a variable WACC. In the small cap premium estimation there are two significant effects, both Q1 and Q3 are negatively and significantly related to the log-odds of using "no small cap" relative to the use of the most frequently selected premium (>6%). An increase in Q1 is associated with an approximately 25% drop in the probability of using "no small cap" relative to the probability of using a small cap larger than 6%. It appears that private firm valuators are more likely to apply a very large small cap compared to no small cap, compared to private equity valuators. Furthermore, an increase in Q3 (education) is associated with an approximated 11.29% drop in using "no small cap".

5. Discussion

In sections 4.1.5, 4.2.10 and 4.3.3 I provide detailed summaries and interpretations regarding the three research questions. In this discussion section I conclude on a general level, as well as proceed with the implications of these findings and their limitations. Following these limitations I propose some recommendations on how to extent the research on this topic. More detailed descriptions on the chapters are in sections 4.1.5 and 4.2.10 and 4.3.3.

In this explorative research I analysed 100 surveys from Dutch professional valuators that were asked to categorize themselves as private equity valuators, public firm valuator or private firm valuator. The private firm valuators and public firm valuators are members of the NIRV. The private equity valuators are valuators from private equity firms.

Regarding research question 1: "*What valuation models are used in valuations of privately held firms in the Netherlands?",* I found that significant evidence that valuators apply DCF and multiples more than asset-based and profit-based models. In their use of multiples transaction multiples are preferred compared to the comparatives of public firm (market multiples). The use of transaction multiples over market multiples does not fit with the theory as proposed by Paleo (2016) but does adhere to the empirical findings in other European studies. As stated in 4.1.5, it appears that availability and the incorporation of synergy and prices biases outweigh the effort of finding suitable public comparables and adjusting these. Multiples are applied as a sanity-check for the outcomes of the DCF, which is the primary valuation tool. Asset-based and profit-based approaches are more situation-specifically applied.

The most used DCF variant is the APV methodology, which has an adoption rate of 80% of the sample, followed by the FCFF and the FCFE. This is not in-line with earlier empirical findings, this may be a sample specific finding as the NIRV strongly favours the APV approach over the others. This idea is strengthened by the fact that mostly the private firm valuators are using the APV approach compared to public firm and private equity valuators. The most used multiples are EV/EBITDA and EV/EBIT, these multiples were hypothesized to be used most, however the other expected well-performing multiple, PE multiples, are only adopted by a very small portion of the sample. This might be a sample specific effect, however it does fit with the preference of transaction multiples versus market multiples as EV/EBITDA is immediately transferrable from valuation object to object, whereas a PE multiple is more difficult to transfer from private firm to private firm. EV/EBITDA is according to theory the most accurate valuation multiple, as it is mostly free from accounting biases. The valuators make use of what is available to them, but also adhere well to theory regarding multiples, although these are not ought to be a primary valuation technique. Valuators stated to select valuation methods based on their theoretical and conceptual accuracy as well as the practical applicability.

On research question 2: "*How are these models applied?"*, I found that the sub-groups differ on four subjects: WACC flexibility, cost of equity estimation, the terminal valuation model, and the estimation of the small cap. Also when selecting tax rates (marginal versus effective), forecast periods and premium sizes, (part of) the sample deviates from prior empirical and theoretical literature. Those who do apply a WACC in their valuation most often tend to use a constant WACC which is not advised in literature as it does not account for variable capital structures of the firm, this is something practitioners could consider if they are opposed to using the APV. When estimating the cost of equity, valuators tend to use a 10-year risk-free-rate, whereas literature describes a 20-year bond at least,

however this seems sensible as the current volatility of the economy is better captured in the 10-year bond, especially since valuators tend to use a shorter forecasting horizon of 2-5 years instead of the advised >10 years. The growth rate of the terminal value is frequently placed at 2%, but this is currently actually a quite high estimate compared to the interest growth. This could be seen as a normalization; however valuators are to be very careful when applying these rates. The small cap is in 40% of the samples valuations dramatically higher than the advised 3.82% premium (>6%), it could therefore be that various effects are captured in this premium, such as marketability and a control premium. The effective tax is often preferred, whereas literature clearly prefers a marginal tax rate. The premium estimations are in practice a lot smaller than literature prescribes, which may be because of current cross-sectional time effects, but it can also be because in practice the estimation of these effects is a very tough task that is often difficult to systematically value consistently.

Generally the literature is adhered to well by the valuators, especially the private firm valuators seem to be applying (recent) literature in their valuations based on the within-group dispersity. This dispersion might be because they have a wider range of valuation purposes, however it might also be that there is an educational effect or a more transparent environment, where discussion regarding valuation methodology is valued highly. Private equity valuators are more likely to select methods based on their valuation perspective, rather than from a fundamental value perspective. Whilst overall adhering to literature quite well, it is advised to tread lightly when valuing terminal values with multiples and cost of equity using IRR, which is potentially vulnerable to the self-fulfilling prophecy effect.

Research question 3 “why are these (valuation) methods selected?” aimed to find explanations as to why differences among the sub-groups exist in valuation method application as well as DCF application. In general it is found here that the education of the valuators as well as their purpose in valuation are the most explanatory factors in the probability of selecting DCF. It is the most used approach and is used in nearly all valuations of these valuators. The application of multiples however is not only strongly related to the valuator type but also to the level of information asymmetry this valuator is facing. The hypothesis that the information asymmetry is consistent per valuator type and that therefore the explanatory power of this information asymmetry factor is captured by the valuator type variable is rejected. More information asymmetry makes the valuators more likely to use multiples in their valuations. Client orientation is not found to have a significant effect on the valuation method selection. Valuator type has been found to be a significant factor in selecting DCF components of which the mean adoption rates differ among the sub-groups. Part of this variation is attributable to education, age, experience, and the standardization of the firm’s valuation techniques, however partially these differences are still unexplained.

The implications of these findings are separable into theoretic contributions and practical contributions. This thesis contributes to the theoretical strand of financial literature of understanding empirical valuation methodologies applied in practice, which has seen only little theoretical interest. This study expands the empirical research on valuation methodology both geographically and demographically as it covers the Netherlands, which has not been studied in such a study before, as well as comparing a very specialized group of valuation professionals (NIRV) with another major influential group of professionals such as private equity valuators. Inspired by surveys of financial researchers, this thesis is built on a standardized survey that can be implemented by future scholars to base quantitative and qualitative research into valuation methods. Future scholars can also conduct

research into a specific identified sub-group to determine adherence of sub-groups to theory further, as well as creating awareness that assumptions regarding a general “valuator” population are difficult to make due to the inherently different methods applied by various sub-groups as shown in this thesis.

Practically this thesis is of interest for entrepreneurs whose firm is the valuation object and valuator professionals that deal with other valuator types (in negotiations) or want to reflect on their own practices. It appears that there are significant differences in the application of various valuation models between sub-groups. These differences stem from some valuator characteristics, but also the level of information asymmetry this party faces. Entrepreneurs should be aware that fundamental value differences might occur for different types of valuators, whilst it could be argued that this should only occur because of price effects.

There are some limitations to this study, of which the limited sample size is most important. The sample size prevented me from running larger logistical regression models, as these require the sample size to be on average 5-10 times the number of variables included in the model. The smaller sample size also prevents me from making more generalizable statements. In future research, the main focus should lay on a larger data collection, without decreasing the details of the survey too much. A second limitations that follows from the sample size issue is that nearly all valuators used DCF as valuation methodology, and although this is promising in terms of adherence to literature, it prevented me from establishing affecting factors regarding the use of DCF, the multiples perspective however provided outcome on the robustness check as it was found to be a substitute of DCF.

Future research can increase the sample size as well as increase the quantitative aspect of this study, it can for example focus on how these valuation techniques applied by the sub-groups affect valuation accuracy, as determined by public comparables or transactional comparisons. Furthermore, the geographical or industry-specific differences can be studied more in-depth.

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Appendix

A. Survey

Questionnaire over het waarderen van niet-beursgenoteerde bedrijven

Q1 Welk type waardeerder van de volgende opties beschrijft u het best?

- Private equity waardeerder
- Beursgenoteerde bedrijven waardeerder
- Niet-beursgenoteerde bedrijven waardeerder

Q2 Hoeveel procent van uw waarderingen betreft private bedrijven?

Q3 Wat is uw hoogst afgeronde opleiding?

- MBO
- HBO Bachelor
- HBO Master
- WO Bachelor
- WO Master
- WO Doctoraat

Q4 Welke extra financiële titel heeft u bemachtigd?

- Geen extra finance titel
- Register Valuator
- Chartered Financial Analyst
- Certified Valuation Analyst
- Register EDP-Auditor
- Anders, namelijk _____

Q5 Hoe veel jaar bent u al actief als waeerder van private bedrijven?

- 0-2
- 3-5
- 6-10
- 11-15
- 15+

Q6 Wat is uw leeftijd?

- 20-30
- 31-40
- 41-50
- 51-60
- 60+

Q7 Welke term typeert uw rol tijdens waarderingen het best?

- Private Equity
- Consultancy
- CFO
- Corporate Finance adviseur
- Ondernemer
- Manager (geen C-level)
- Anders _____

Q8 Gerekend vanuit EBITDA, hoe groot zijn (gemiddeld) de *niet-beursgenoteerde* bedrijven die u waardeert ?

- €0-€100,000
- €100,001-€500,000
- €500,001-1,000,000
- €1,000,001-€2,000,000
- €2,000,001-€5,000,000
- €5,000,001-€10,000,000
- €10,000,001-€25,000,000
- >€25,000,000

Q9 Voor welke van de volgende situaties, waar waarderingen toepasselijk zijn, voert u waarderingen uit? (Meerdere antwoorden mogelijk)

- Aankoop begeleiding
- Verkoop begeleiding
- Indicatieve waarderingen
- Management Buy-out
- (Her)financieringstrajecten
- Wettelijke waarderingen
- Aandelenwaarderingen
- Anders _____

Q10 Voor bedrijven uit welke industrieën voert u waarderingen uit? (Meerdere antwoorden mogelijk)

- Zakelijke dienstverlening
- Industrie & Productie
- IT, Online & E-commerce
- Bouw & Installatietechniek
- Automotive, Transport & Logistiek

- Groothandel
- Gezondheidszorg & Farmacie
- Agri & Food
- Horeca, Toerisme & Recreatie
- Detailhandel
- Media, Reclame & Communicatie

Q11 Kunt u kort beschrijven wat de rol is van waarderingen bij een transactie?

_____

Q12 Hoeveel procent van uw waarderingswerkzaamheden betreft *niet-beursgenoteerde* bedrijven?

- 0-25%
- 26-50%
- 51-75%
- 76-100%

Q13 Geef aan in hoeverre u het eens bent met de volgende stelling over een typische waardering: "Ik heb een perfecte toestroom van informatie over het waarderingsobject". (*Denk hierbij aan de kwaliteit van data, de openheid van het management, de transparantie van de sector en de belangen van de opdrachtgever)*

- Volledig oneens
- Oneens
- Neutraal
- Eens
- Volledig eens

Q14 Welke waarderingsmodellen gebruikt u in het waarderen van niet-beursgenoteerde bedrijven? Indien u meerdere methoden gebruikt kunt u meerdere antwoorden selecteren.

- Discounted Cash Flow methodes
- Multiples gebaseerd op waarderingen van beursgenoteerde bedrijven (market-based multiples). Indien deze gebruikt worden graag de meest gebruikte multiples hieronder invullen. _____
- Multiples gebaseerd op vergelijkbare transacties (transaction-based multiples). Indien deze gebruikt worden graag de meest gebruikte multiples hieronder invullen. _____
- Intrinsieke waarde van de activa (asset-based models / liquidation models)
- Winst gebaseerde modellen (zoals de (verbeterde) rentabiliteitswaarde)
- Anders _____

Q15 Geef aan in hoeverre u het eens bent met de volgende stelling: 'Ik gebruik altijd dezelfde waarderingsmethoden'

- Volledig oneens
- Oneens
- Neutraal
- Eens
- Volledig eens

Q16 Geef aan in hoeverre u het eens bent met de volgende stelling: 'Mijn bedrijf heeft een standaard manier van waarderen'.

- Volledig oneens
- Oneens
- Neutraal
- Eens
- Volledig eens

Q17 Geef aan in hoeverre u het eens bent met de volgende stelling: 'Een bedrijf in de software industrie waardeer ik met hetzelfde waarderingsmodel als een bedrijf in de retail'

- Volledig oneens
- Oneens
- Neutraal
- Eens
- Volledig eens

Q18 Geef aan in hoeverre de volgende <u>bedrijfsspecifieke</u> factoren belangrijk zijn tijdens het selecteren van een waarderingsmethode? ***Waarin 1 = totaal niet belangrijk, 2 = niet belangrijk, 3 = neutraal, 4 = belangrijk, 5 = zeer belangrijk***

	zeer onbelangrijk	onbelangrijk	neutraal	belangrijk	zeer belangrijk
De industrie waarin het waarderingsobject zich in bevindt	○	○	○	○	○
De groei jaar op jaar die het bedrijf doormaakt	○	○	○	○	○
De kwaliteit van de financiële rapportage die het bedrijf aanlevert	○	○	○	○	○
De hoeveelheid financiële rapportage die het bedrijf aanlevert	○	○	○	○	○
De bedrijfsgrootte	○	○	○	○	○
Of het bedrijf beursgenoteerd of niet-beursgenoteerd is	○	○	○	○	○
Tastbaarheid van de activa (verhouding materiële t.o.v. totale activa)	○	○	○	○	○
Informatie asymmetrieën over het waarderingsobject	○	○	○	○	○

Q19 Geef aan in hoeverre de volgende <u>projectspecifieke</u> factoren belangrijk zijn tijdens het selecteren van een waarderingsmethode? *Waarin 1 = totaal niet belangrijk, 2 = niet belangrijk, 3 = neutraal, 4 = belangrijk, 5 = zeer belangrijk*

	zeer onbelangrijk	onbelangrijk	neutraal	belangrijk	zeer belangrijk
Of de waardering in het kader van een transactie wordt uitgevoerd	○	○	○	○	○
Als de waardering transactie-gerelateerd is, of u aan de aan- of verkoopzijde van de deal zit	○	○	○	○	○
De intuïtie van de waardering ('het verhaal') naar de cliënt toe	○	○	○	○	○
Het doel van de waardering	○	○	○	○	○
De cliënt zijn begrip van de waardering	○	○	○	○	○

Q20 Indien u gebruikt maakt van zowel een DCF methode als multiples, geef aan hoeverre u het eens bent met de volgende stelling: 'DCF is belangrijker dan een multiple in al mijn waarderingen'

- Niet van toepassing (Ik gebruik slechts 1 van deze methodes, óf een andere waarderingsmethode)
- Volledig oneens
- Oneens
- Beide methoden zijn even belangrijk
- Eens
- Volledig eens

Q21 Welke multiple ratio's gebruikt u in uw waarderingen van *niet-beursgenoteerde* bedrijven? Indien u meerdere multiples gebruikt kunt u meerdere antwoorden selecteren.

- Ik gebruik nooit multiples
- Koers / omzet (Price/Sales)
- Ondernemingswaarde / winst (EV/Net profit)
- Koers / boekwaarde (Price/Book value)
- Koers / winst (Price/Earnings)
- Ondernemingswaarde / EBIT (EV/EBIT)
- Ondernemingswaarde / omzet (EV/Sales)
- Ondernemingswaarde / EBITDA (EV/EBITDA)
- Anders _____

Q22 Welke varianten van DCF gebruikt u in uw waarderingen van *niet-beursgenoteerde* bedrijven? Indien u meerdere methoden gebruikt kunt u meerdere antwoorden aanklikken.

- Dividend Discount Model (Dividend Discontering model)
- Free Cash Flow to the Firm (Vrije kasstromen beschikbaar voor de gehele firma)

- Free Cash Flow to the Equity (Vrije kasstromen aandeelhouders)
- Adjusted Present Value (FCFE + Waardering van het belastingschild)
- Economic Value Added (Economisch toegevoegde waarde)
- Anders _____

Q23 Waarom gebruikt u dit model / deze modellen?

_____
_____

Q24 Aansluitend op de vorige vraag; indien u meerdere waarderingsmethoden gebruikt, zou u aan willen geven hoe deze modellen een rol spelen in een waardering? *(bijvoorbeeld DCF is leidend, maar asset-multiples zijn een minimum prijs in een onderhandeling etc.)*

_____
_____

Q25 Hoeveel jaren worden gemiddeld geprognosticeerd (forecast period) in de waardering?

- 1 jaar (oneindige lijfrente)
- 2-5 jaar
- 6-8 jaar
- 9-12 jaar
- Meer dan 12 jaar

Q26 Hoe berekent u de restwaarde (terminal value) ? Indien u gebruikt maakt van meerdere methoden kunt u meerdere antwoorden aanklikken

- Gordon's groei model (geef aan welke groei jaar-op-jaar is in procenten)
  _____
- Conversie model (convergence model); TV = NOPAT/WACC
- Multiples (geef aan welk multiple u het meest gebruikt)
  _____
- Value-driver model; TV=(NOPAT * (1+g) * (1-g/ROIC))/(WACC-g)
- Anders _____

Q27 Welke informatie is volgens u het moeilijkst om te kunnen bemachtigen bij de cliënt?

_____
_____

Q28 Welk model vormt bij u de basis voor de kostenvoet van het eigen vermogen (Cost of Equity)?

- CAPM
- Gemodificeerde CAPM variant (Geef aan welke variant)
  _____
- Internal Rate of Return
- Gebaseerd op ervaring
- Build-up methode
- Anders _____

Q29 In CAPM, hoe bepaalt u de Beta coëfficiënt?

- Gebaseerd op een gemiddelde van beursgenoteerde vergelijkbare bedrijven
- Gebaseerd op regressies van de fluctuaties van de boekhoudkundige winst
- Gebaseerd op een industrie beta
- Gebaseerd op ervaring
- Anders _____

Q30 Hoe wordt de risicovrije rentevoet (risk-free rate) bepaald?

- Korte Nederlandse obligatie (
- 10-jarige Nederlandse obligatie
- 20-jarige Nederlandse obligatie
- 30-jarige Nederlandse obligatie
- Anders _____

Q31 Hoe wordt de marktrisicopremie (market risk premium) bepaald?

- Aandelenpremie die investeerders verwachtingen van rendement op aandelen reflecteert
- Historische aandelenpremie (historical equity premium)
- Vooruit kijkende premie gebaseerd op huidige markt
- Basis premie volwassen markt + een landrisico premie
- Overgenomen vanuit een publicerend instituut/auteur (geef aan welke) _____
- Anders _____

Q32 Welke bedrijfsspecifieke premiums voegt u toe om andere risico's in de vermogenskostenvoet te tonen? Meerdere antwoorden mogelijk

- Geen extra premiums
- Afhankelijkheid van management
- Afhankelijkheid van leveranciers
- Afhankelijkheid van klanten
- Track record
- (Gebrek aan) spreiding van de activiteiten
- Overdraagbaarheid van de aandelen
- Anders _____

Q33 Hoe bepaalt u welke premiums toegevoegd moeten worden aan de vermogenskostenvoet of waardering?

- Op basis van wetenschappelijk onderzoek wordt de toepassing en hoogte van de premiums bepaald
- Op basis van een systematisch systeem wordt de toepassing en hoogte van de premiums bepaald
- Op basis van ervaring
- Anders, namelijk _____

Q34 Hoe groot is de premium kleine bedrijven (small-cap premium) die u toevoegt aan waardering van kleine bedrijven?

- Geen premium kleine bedrijven
- 0-1%
- 2-4%

- 4-6%
- Meer dan 6%

Q35 Hoe is de vermogenskostenvoet vreemd vermogen (cost of debt) bepaald in uw waarderingen van *niet-beursgenoteerde* bedrijven?

- Gebaseerd op de boekwaarde van de rente gedeeld door de boekwaarde van de rentedragende schulden
- Gebaseerd op de huidige effectieve rentevoet van het bedrijf
- Gebaseerd op een gemiddelde van de effectieve rentevoet van de industrie sector waarin het bedrijf zich bevind
- Gebaseerd op een "synthetische obligatie rating" (synthetic bond rating), berekend over het bedrijf haar interestdekkingsgraad (interest coverage)
- Anders _____

Q36 Gebruikt u een constante of een variabele Weighted Average Cost of Capital (WACC) door de gehele prognose periode heen?

- Constant
- Variabel
- Afhankelijk van de situatie (licht toe alstublieft)
  _____
- Ik gebruik geen WACC

Q37 Hoe zijn de gewichten van eigen vermogen en vreemd vermogen bepaald in de WACC?

- Gebaseerd op boekwaarden van eigen vermogen en vreemd vermogen
- Gebaseerd op een 'beoogde' kapitaalstructuur
- Gebaseerd op een industrie gemiddelde kapitaalstructuur
- Gebaseerd op geschatte marktwaarden van eigen vermogen en vreemd vermogen
- Ik gebruik geen WACC

Q38 Welk belastingtarief gebruikt u in de WACC berekening bij het berekenen van de vermogensvoet van het vreemd vermogen?

- Effectieve belastingtarief van de onderneming
- Marginale belastingtarief van de onderneming
- Anders _____
- Ik gebruik geen WACC

Q39 Hoe groot is de discount voor het gebrek aan overdraagbaarheid van private aandelen (marketability premium, ook wel private firm discount) ?

- Geen premium voor het gebrek aan overdraagbaarheid van private aandelen
- 0-10%
- 11-20%
- 21-30%
- Meer dan 30%

Q40 Waarop is deze 'private firm discount' gebaseerd?

_____

Q41 Hoe groot is de premium voor het *verkrijgen* van een meerderheidsbelang in een bedrijf in uw waarderingen van *niet-beursgenoteerde* bedrijven?

- Er is geen premium voor het verkrijgen van een meerderheidsbelang
- 0-5%
- 6-10%
- 11-15%
- >15%

Q42 Maakt u nog andere laatste aanpassingen aan de definitieve ondernemingswaarde?

_____
_____

Q43 Heeft u nog op- of aanmerkingen op bepaalde vragen of overige opmerkingen?

_____
_____

B. Hypothesis list

1. What valuation models are used in valuations of privately held firms in the Netherlands?

1. DCF & multiples significantly more important than asset- & profit-based.
2. Valuators use both multiples and DCF, but DCF is dominant.
3. FCFF is used more than all other cashflow methods.
4. The EV/EBITDA and the PE multiple are significantly more important than other multiples

2. How are these models applied?

DCF

❖ Cost of capital

5. A constant WACC is used less often than a variable WACC.
6. Weights of the WACC are equally likely to be based on market values as book values.

❖ Cost of equity

7. The build-up method is used more than CAPM in valuing privately held firms.
8. The 20-year Dutch treasury bond is the preferred proxy for the risk-free rate.
9. Beta is most often estimated using peer groups (i.e. industry beta).

❖ Cost of debt

10. The cost of debt of a firm is more often based on the effective interest rate of the firm than on any other cost of debt estimation method.

❖ Tax rate

11. Valuators more often use the marginal tax rate rather than effective tax rate.

❖ Terminal value

12. Valuators use Gordon's growth model most often to value terminal value.
13. The most used terminal growth rate is the Dutch national GDP forecast.

❖ Forecast period

14. The most used forecast period is between 6 and 8 years.

Adjustments

15. Valuators apply discounts for small cap, minority marketable value and control value.
16. Premiums for privately held firms are qualitatively and subjectively applied on the valuation rather than quantified.
17. The privately held firm premium is between 30-40% of the price compared to a public firm.

3. Why are these valuation models selected?

❖ *Type of valuator*

18. Private equity valuators feel to face less information asymmetry than financial advisors.
19. Private equity valuators are equally high educated and experienced as financial advisors.
20. Private equity valuators are less client oriented than financial advisors.

❖Information asymmetry

21. Information asymmetry is negatively related to the use of DCF.

❖ *Valuator characteristics*

22. Valuators who finished a financial graduate study are more likely to use DCF than those who did not finish a financial graduate study.
23. More experienced valuators are more inclined to use multiple valuation.

❖ Client Orientation

24. Client orientation is positively related to use of DCF