Innovative Management Perspectives on Confronting Contemporary Challenges

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Edited by

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CHAPTER ONE

COST OF EQUITY CAPITAL IN PRIVATE COMPANIES

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1 Introduction

In company valuation as well as in value-based management (VBM) the cost of capital (COC) is one of the key elements (AIR, 2010) and in the meantime it is one of the central problems in the value-enhancement analysis (Herter, 1994). COC is the profit that investors have to give up instead of investing elsewhere. It has two elements in it: a) the timing of the expected returns and b) the risk of alternative investments (Young and O'Byrne, 2001). That is why it is used as the discount rate for projecting present values of the future cash flows in valuation theory, for calculations in value-based management metrics (e.g. Economic Value Added, Shareholder Value) as well as a hurdle rate for accepting new investments (Stewart, 1991). The effectiveness of VBM measures highly depends on the accuracy of the calculation of the capital costs (Männel, 2006). Studies show that the difficulty of calculating the COC is in determining the requirement of return of the equity holders – cost of equity capital (CEC) (Geginat et al., 2006). The estimation of the cost of equity is difficult because there are many uncertainties to consider (Britzelmaier, 2013b). This is true for all companies, but is highly emphasized for private companies. The reason is that the calculation of CEC for publicly listed companies is possible with established mathematical models such as Capital Asset Pricing Model (CAPM) or Arbitrage Pricing Theory (APT),

which however base on the condition of stock market listing. This is a condition, which naturally is absent for private companies.

Existing literature on cost of equity capital mainly focuses on calculation methods for large companies, which also still demand further research. There are some papers about cost for privately held firms (e.g. McConaughy, 1999; Cotler and Fletcher, 2000 or Harjoto and Paglia, 2012) but existing literature still lacks, to a certain extent, an overview of which calculation methods are valid and applicable for private companies. The objective of this paper is to summarize and present solutions and methods to calculate the cost of equity capital for private companies. In doing this, this paper will critically analyze the validity of the most common CEC calculation method, namely CAPM for private companies. As the CAPM-derived methods for private companies are highly questioned, other methods are analyzed and presented. Although this paper does not include specific cases and is based on literature review, it is the intention of the authors to provide a practical guide for financial analysts and controllers to have an overview and a guideline in order to be able to calculate the cost of equity capital for private companies.

2 Fundamental Principals of cost of capital

Background and Weighted Average Cost of Capital

There are basically two approaches to the estimation of the cost of capital – subjective and objective. According to the decision oriented valuation principles, the COC is derived from the subjective decision making of individual investors (Pape, 2010 and Pereiro, 2002). In finance theory, however, an attempt is made to objectify the COC, thereby the COC represents the opportunity cost of a particular investment under the consideration of risk aspects (Ballwieser, 1994, as cited in AIR, 2010 and Bühner and Sulzbach, 1999). The capital providers expect certain compensation – a minimum rate of return – for the opportunity cost of investing their capital in a particular company instead of others with an equivalent risk (Khadjavi, 2005; Pereiro, 2002; Pape, 2010 and Copeland et al., 2000).

The capital costs are represented by the expectations of debt holders regarding interest payments and expectations of equity providers regarding dividend payments or stock price profits (Britzelmaier, 2013b). In the classical finance theory the COC represents the business risk. However

besides the business risk in COC, the financial risk also plays a major role, mostly through the capital structure component in the most common cost of capital formula – the Weighted Average Cost of Capital (WACC) (Coenenberg and Salfeld, 2007).

Studies show that most companies (83%) use WACC for the calculation of the cost of capital (Britzelmaier, 2013a; Geginat et al., 2006) as shown in Formula 1. C_{Equity} and C_{Debt} stand for the costs of Equity and Debt Capital, respectively.

Formula 1: Weighted Average Cost of Capital

$$WACC = \frac{Equity}{Equity + Debt} \times C_{Equity} + \frac{Debt}{Equity + Debt} \times C_{Debt} \times (1 - Tax\ Rate)$$

Whereas all components of WACC can be calculated relatively easily and do not present complications in practice, the cost of equity capital is the pain point of the formula.

The determination of the capital structure follows either a) by calculating the actual capital structure with market or book values of debt and equity or b) by applying the target capital structure. In general the actual market values of debt and equity are recommended to be used and not the actual book values, as the market values show how much it would cost to raise the same capital today – opportunity approach of raising capital (Young and O'Byrne, 2001; Vishwanath and Krishnamurti, 2009). Applying the market value of equity is clearly better because of the increasing meaning of the intangible assets which are referred to as hidden reserves. Many intangible assets are not activated under the existing Generally Accepted Accounting Principles (GAAP), thus resulting in divergence of the market and book values of the equity. As the book value of the debt usually does not vary so much from its market value, it can be used instead of the market value (Tappe, 2009). Whereas the market value of equity for publicly listed companies can be calculated by multiplying the number of outstanding shares with the stock price on the date of calculation, the market value of equity for unlisted companies is quite difficult to calculate (Hostettler, 2002).

Instead of using actual values of debt and equity (regardless book or market) to determine the weighting ratios, the target capital structure can also be deployed in the WACC calculation. This recommendation is made mainly for the valuations for long-term periods in order to avoid short-

term changes in the market value of the securities or other short-term financing activities and mainly for private firms (Copeland et al., 2000; Britzelmaier 2013b). The implicit assumption under this approach is that even though the current capital structure differs from the target, future financing decisions will bring the capital structure closer to the target (Young and O'Byrne, 2001). The target capital structure method is also recommended because of its calculation easiness, especially for not listed companies. This also solves the so called circularity problem for private companies, which arises due to the need of cost of capital as a discount rate during the calculation the market value of equity (Tappe, 2009). In theory the circularity problem can be solved with iterations methods, where, mathematically, all possible scenes are played until the relevant capital structure is found (Pape, 2010). In practice it is not easily applicable, so that the target capital structure can be used instead (Pape, 2010).

Furthermore, the determination of the cost of debt and the tax rate can follow relatively easily. The cost of debt can be derived either a) by dividing actual debt interest payments over the average debt (Dörschel et al., 2009); b) by using the contractually agreed interest rate or c) by implementing the actual market rate of return in the case of bonds (Töpfer and Duchmann, 2006). The tax rate is considered in the WACC formula because of the so called tax shield effect. The tax shield effect occurs because the interest payments for debt are tax-deductible, i.e. the more interest payments the company has, the less tax it pays on the income (Young and O'Byrne, 2001). Therefore, the more the company is leveraged (more debt), the more effect has the tax shield on the WACC. The tax shield in WACC formula is considered under the assumption of a fictive only with equity financed firm (Hostettler, 2002). Usually a normalized country specific company tax rate is used.

The remaining component, the cost of equity capital is the main focus of this paper so it will be discussed separately in the next section.

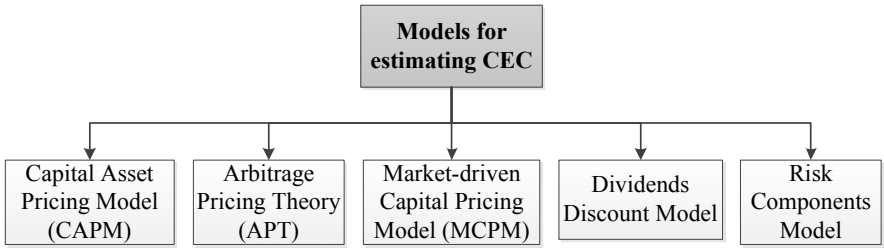
Alternative Approaches of Cost of Equity

Figure 1 illustrates the different models, which have established in the literature and practice for calculating cost of equity capital.

In general from all presented methods, only CAPM (with further model enhancement) and the Risk Components Model can be considered for

private companies. This is due to the lack of existence of stock prices as required for CAPM, APT, MCPM and DDM Models. Being the most widely used method for CEC calculation CAPM builds and therefore a separate section is devoted to this method.

Figure 1: Possible Models for Estimating Cost of Equity Capital



Source: Based on Britzelmaier (2013b)

Capital Asset Pricing Model (CAPM)

The most common used method (according to Geginat 2006 about 2/3 of the firms examined determine their CEC with CAPM) of estimating the CEC is the CAPM, a capital market and portfolio theory model developed by Sharpe, Lintner and Mossin based on Tobin's and Markowitz's models (Tappe, 2009; Pratt and Grabowski, 2010). This model has been developed especially to determine the CEC for publicly listed companies because there are normally numerous investors and it is complicated to calculate a single expected rate of return for unknown investors. The solution has found in observing the capital market behavior through this model (Young and O'Byrne, 2001). It considers the return from a risk-free investment and a market premium. With the help of the Beta factor the systematic risk of each security relative to the market portfolio is brought into calculation.

Formula 2: CAPM Model Formula

$$r_{(Equity)} = r_{(Risk-free)} + \left(r_m - r_{risk-free}\right) \times \beta$$

where r_m is the rate of return of the market portfolio and therefore (r_m- r_f) is the market risk premium of the equity; ß is called market Beta or Beta factor.

A number of assumptions are laid under the CAPM model, which brings some limitations (Pratt and Grabowski, 2010 and Perridon and Steiner, 2007). Normally the yields of long-term government bonds with "best credit rating" are considered for $r_{(risk\text{-}free)}$ (Bark, 2011). The 30-year and 10-year government bonds are mostly recommended in the literature as they are relatively easily determinable in the practice. For the calculation of the market premium (r_m- r_f) the required return of the market portfolio can be calculated ex-ante or ex-post by trying to estimate the future or by extrapolating historical development to the future, respectively. Both approaches have their proponents and critics (Copeland et al., 2000). Usually a market index, such as EuroStoxx, DAX or S&P 500 is considered.

The bottom line is that except for company-specific β factor, all other components of CAPM can be calculated regardless whether the company is publicly traded or not.

The Beta factor is normally calculated using historical market data by regressing the stock's return against the return of a stock index (e.g. DAX Index) (AEU, 2002). Mathematically, it can be also calculated by dividing the covariance of the stock in subject and the market portfolio to the variance of the market portfolio as shown in the formula below (Dörschel et al., 2009).

Formula 3: Beta Factor

$$\beta = \frac{Cov(r_e;\ r_m)}{Var(r_m)}$$

where $Cov(r_{e;}\ r_m)$ is the covariance between the return of the equity and the market and $Var(r_m)$ is the variance of the return of the market.

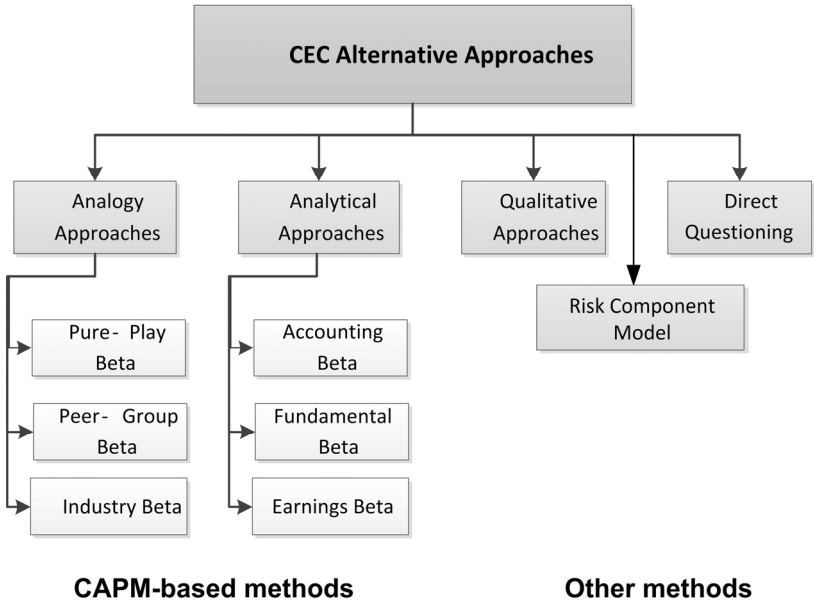
For companies that are not publicly traded, the decisive factor ß becomes a problem as the relevant capital market figures cannot be derived (Günther, 1997). Hence CAPM is not valid for private of companies without further adjustments or by using other alternatives (Vélez-Pareja, 2005).

3 Cost of equity capital for private companies

Overview of Alternative Approaches

Being the most common method of calculating the CEC, CAPM is supposed to objectively estimate the CEC from the market. However, many scholars heavily criticize the model regarding its anticipated objectivity and claim that the discount rate is a completely subjective parameter and that no formula can yield to better results than a simple subjective judgment (Pereiro, 2002). This is especially true for privately held companies where the direct calculation of CAPM does not apply anyway due to lack of historical stock prices for the computation of the Beta factor and the not fulfillment of the CAPM assumptions. Especially the SMEs or even large family owned companies are often publicly not listed and the estimation of risk-adequate capital costs is the largest critic of VBM concepts in such companies (Tappe, 2009). Nevertheless, financial analysts and practitioners have developed methods which allow the estimation of the CEC for such cases which are summarized in the following figure (Geginat et al., 2006; Bufka et al., 1999 and Britzelmaier, 2013b):

Figure 2: CEC Calculation Methods for Private Companies



Source: Own Illustration based on Geginat et al. (2006) and Michels (2008)

These methods are not only useful for privately held companies, but also for company divisions of publicly listed companies. Often the risk of divisions is not the same as the overall group risk and the individual cost of capitals need to be calculated.

Analogy Methods (Comparable Company Approach)

The first, and in practice most commonly used, cluster of CAPM-derived CEC is referred to as the Analogy Methods, which was initially suggested by Van Harde and then tested by Fuller and Kerr to estimate the divisional CEC. The Analogy Methods or also referred to as comparable companies' approach (CCA) are the most common methods of calculating Betas for private companies. Here the Beta for the company in subject is approximated from that of a single listed comparable firm (Pure-Play Beta), or alternatively from several comparable firms (Peer-Group Beta) or from the industrial average (Industry Beta) (Geginat et al., 2006 and AWFMU, 2004). The implicit assumption is that the risk of the unlisted company is the same as that of the comparable listed ones and therefore the risk can be derived from the market (Bühner and Sulzbach, 1999). The Betas calculated from Analogy Approaches are sometimes referred to as bottom-up Betas (Damodaran, 2002).

Pure Play Beta

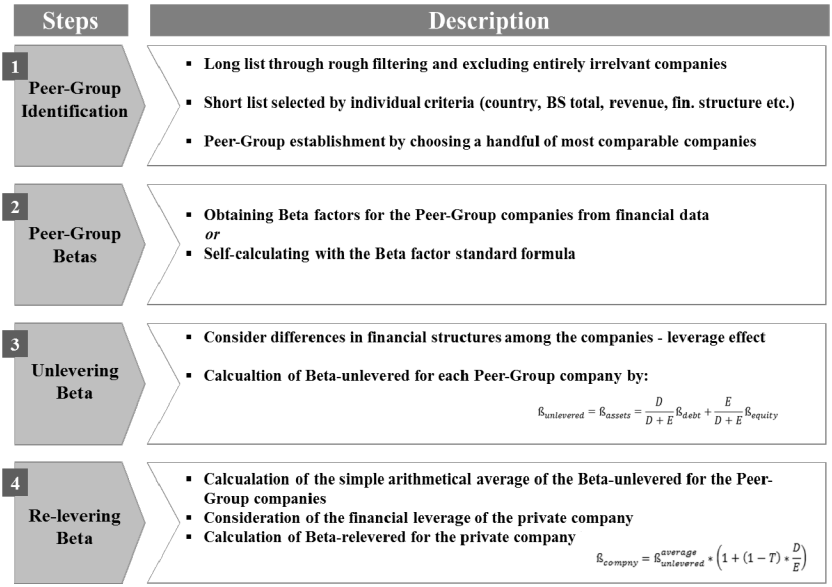
The original model of Van Herde suggested to proxy the unlisted company to a single comparable listed company. However due to special statistical effects this method is not recommended (Bark, 2011). The estimation error for a single company is higher than for a portfolio of companies. This is why the method was expanded to include more than just a single company. By using Peer-Group or the Industry Beta the standard estimation error decreases (Bowman and Rush, 2004). Moreover, finding a very similar company can often be problematic (Erhardt and Bhagwat, 1991). Thus in practice the pure play method is not recommended.

Peer-Group Beta

So by using Peer-Group the standard estimation error decreases to the extent that the comparability among the proxy companies to the private company decreases (Bowman and Rush, 2004). As the Peer-Group approach is the most widely used the standard approach of the Peer-Group calculation is demonstrated in figure 3.

One approach of determining the Peer-Group is to establish what is called a long list of the listed comparable companies through rough filtering criteria. The long list excludes entirely irrelevant companies (Geginat et al., 2006). Then through individual selection criteria the relevant short list is created. The possible criteria might include the country, BS Total, financing structure, asset intensity and structure, sales revenue, sales growth, EBITDA, number of employees, product portfolio, composition of the sales (Geginat et al., 2006 and Herter, 1994). Then the Peer-Group of the most comparable companies is established.

Figure 3: Calculation Steps for Peer-Group Beta



Peer-Group Identification (Step 1)

This step is the most crucial as it requires subjective judgment as to which companies should be included and which excluded from the Peer-Group and this will affect the outcome of the Cost of Equity. In the first step, it should be attempted to find comparable publicly listed firms having similar operating activities as the firm in subject. However, occasionally, private companies have very specific business models and the number of similar companies can be very limited so that finding such companies

might be much harder as thought at first sight. In this case, financial analysts can rely on the experience and knowledge of the management. The management can be asked to name comparable publicly listed companies, which are influenced from the same market forces as the valuated private company. This approach is beneficial especially for those private companies, which are family owned and the founders have been highly active in the management since decades and so their knowledge and expertise is first-hand and should be profited from.

In the selection of the Peer-Group the companies should be thoroughly chosen. Companies which had their IPO earlier than 1 year ago are generally not recommended to be included as including them will affect the Beta calculation by statistically distorting the results. Internet sources such as Yahoo Finance can be a very helpful practical tool to find comparable companies as they offer such information at hand. Additionally, short profiles for each company can be obtained from financial internet sources in order to examine their core competencies in comparison to the private company. Generally, the more companies are included the better are the statistical properties of the estimation (Bowman and Rush, 2006). When the private company has a very specific business and the number of comparable companies is limited anyway, further selection criteria cannot be implemented (e.g. company size, revenue, country etc.). Normally, the more the size of the private company approximates the size of the comparable companies, the less biased is the method. Therefore, it is recommended to consider the size effect in CCA method for Beta calculation (Bowman and Rush, 2006). Normally if the private company is smaller as the peers, this will result in underestimating the Betas. Gross revenue is usually used to compare the companies.

The geographical area is also essential for determining the Peer-Group (Geginat et al., 2006). Even if the operating activities of the firms are the same, the presence in different geographical areas might result in different unsystematic risks (Erhardt and Bhagwat, 1991). A further limitation in Peer-Group composed from companies from different countries as that of the private company represent effects from foreign exchange rates, which are not considered in this model. Here, a further assumption must be made that foreign exchange rates don’t have an essential influence. This can in fact be true for those companies which are globally active and anyhow affected by the same currency effects.

Peer-Group Betas (Step 2)

After the relevant companies have been identified, the Betas of these companies are required. Beta factors can be obtained from different financial sources such as Bloomberg or Yahoo Finance. Otherwise the Beta factors for the selected companies are calculated with the standard formula. The problem of obtaining the data from financial sources is that the Betas of all the selected companies need to be found in one source; otherwise they will not be comparable. This is because the CAPM model does not give any calculation specification. Even though the Beta factor has been established to be a benchmark financial measure, Betas from different sources might alter, depending on the time period chosen for the calculation, the market index as well as the frequency of the returns in the regression model. Here it is to point out once more, that there is no right or wrong, it is just a matter of subjective input of the required data by the financial analyst carrying out the valuation.

Unlevering Betas (Step 3)

When using the Analogy Approaches, normally, the capital structure of the private company will be different from the comparable ones (Bark, 2011). As the financial risk significantly affects the Beta, i.e. the more leveraged the company is the higher will be the Beta, the leverage effect has to be eliminated for calculating the company Beta (Süchting, 1989, as cited in Herter 1994).

Regardless of the Analogy Method chosen (Pure Play, Peer-Group or Industry) the Beta taken has to be unlevered and then re-levered using the debt to equity ratio and the tax rate for the company subject to calculation.

The most common formula for unlevering is the following (Michels, 2008, and Herter, 1994):

Formula 4: Unlevering Beta

$$ß_{unlevered} = ß_{assets} = \frac{D}{D+E} ß_{debt} + \frac{E}{D+E} ß_{equity}$$

In practice however, this relation is complemented with two further assumptions: 1) the β_{debt} is zero, i.e. the debt is risk-free and 2) the tax rate is not affected from the capital structure (Serfling and Marx, 1990, and

Copeland, 1990, as cited in Herter, 1994). Under these assumptions the following equation for the equity Beta can be derived for a company, which is fully financed with equity[1]:

Formula 5: Unlevering Betas of the Peer-Group[2]

$$ß_{unlevered} = \frac{ß_{equity}}{1 + \frac{D}{E}(1 - T)}$$

After the unlevered Betas for the Peer-Group have been calculated it is necessary to calculate the average Beta of the Peer-Group. Generally geometrical, arithmetical or median averages can be used (Geginat et al., 2006), however mostly simple arithmetical average is calculated. This is done to obtain one single unlevered Beta in order to be able to in the re-levering formula.

Re-levering and Beta Calculation (Step 4)

After determining one single unlevered Beta for the Peer-Group (Step 3), the final step is to calculate and re-lever the Beta for the valuated company considering its financial leverage using the following formula:

Formula 6: Re-levering of the Beta for the Company

$$ß_{compny} = ß_{unlevered}^{average} * \left(1 + (1 - T) * \frac{D}{E}\right)$$

However, the consideration of the leverage effect can lead to over or under estimation of the CEC (Fuller and Kerr, 1981; Schlegel 2011 and Bowman and Rush, 2004). Thus, one should be cautious when using the Analogies Method and the plausibility of the CEC should be proven with other calculation methods.

Another problem in CAPM-derived CCA calculation can arise when the company in subject is in a country, where market capitalization is

[1] When a "no-debt" company is assumed, then the tax shield effect has to be considered as well. The logic is the same as with tax shield consideration in WACC.

[2] There are several formulas for re-levering the Betas, mainly depending on the financing structure (fixed book value or market driven value of debt) (Fernandez, 2006). However, the most common approach is here presented (fixed book value).

relatively low. This is the case for many European countries, which compared to Anglo-Saxon countries are mainly bank financed. This prepares the difficulty of finding Peer-Group companies in the same country. In this case data from e.g. USA can be employed (Herter, 1994). However this challenges the comparability of the companies in terms of exchange rates and business environment.

Industry Beta

Although the Industry Beta improves the statistical method, an additional assumption, implicitly made, is that the systematic risk within the same industry is the same (Herter, 1994). Moreover, in specific cases it might also be difficult to place the company in one particular industry. Thus the Peer-Group Method form the Analogy Approaches is considered more plausible and unless it is impossible to calculate, then it is recommended to use the Industry Beta (Pape, 2010). The Industry Betas can be obtained from various financial sources. Once the Beta is available, the methodology of transforming Industry Beta into the company's Beta is the same as in the case of the Peer-Group Beta starting however with the 3rd step – unlevering of Industry Beta.

Analytical Approaches

In these approaches it is attempted to find a relationship between accounting-based measures of systematic risk and the market-based systematic risk measures (Erhardt and Bhagwat, 1991 and Bufka, et al., 1999). It is, thereby, assumed that the accounting data are influenced from the same events and information as the market price data (AF, 1996). The underlying approaches are the Earnings Beta, the Accounting Beta and the Fundamental Beta.

In Earnings Beta, the changes in quarterly earnings of the private firm are regressed against changes in quarterly earnings for an equity index (S&P 500, DAX etc.) to estimate the Beta factor (Damodaran, 2002).

Formula 7: Earnings Beta

$$\Delta Earnings_{Private\ Firm} = a + b\Delta Earnings_{Equity\ Index}$$

The slope of the regression – the parameter b – is the Beta for the firm. The limitation of this approach is that the private firm's earnings are

usually available only on yearly basis, which will result in limited statistical power. Moreover, the mismatches resulting from accounting principles among firms might lead to wrong Betas (Damodaran, 2002). In the case of the Accounting Beta approach more than one accounting measure is taken into consideration. The principle is however the same as that of the Earnings Beta. The Fundamental Beta approach tries to find specific characteristics of the firm, which have a relation with the systematic risk. Many researchers have tried to find a relation of various measures of publicly listed firms to that of private firms in the attempt to estimate Betas for private firms. Such measures can be earnings growth, debt ratio, company size, foreign income or dividend payout. The weakness of this approach is that it is assumed that the Beta factors of different companies would react the same way on the changes of these fundamental factors (Damodaran, 2002 and AF, 1996 and references there).

The Analytical Approaches are generally plausible models, but the calculations are complex and not easily applicable in practice. However, the main issue in these models can occur when the company in subject has experienced a great external growth through acquisition in the prior years. Often the acquisitions are done gradually and the consolidation decisions have a legal or tax background. This can significantly distort the regression results of the analytical methods as these models require a large amount historical data, preferably quarterly financial measures, which can be statistically biased.

Validity of CAPM-derived Methods for Private Companies

As discussed in the previous chapter, the most common way of estimating CEC for private companies is by using Analogy Approaches. This methods allow to calculate the Beta of a private company and thus also the CAPM. But can this CEC be applied to private firms without hesitation? In this part, the plausibility of market derived calculation of CEC is proven. As it was emphasized before, the Betas calculated with these methods can be under or over estimated. But here the overall model of CAPM for the purposes of private companies is questioned. In order to prove the plausibility of CAPM, in the first place the model's underlying assumptions are proven and the question is raised whether or not CAPM can be applied when these assumptions diverge greatly for privately held companies. The deviation of the CAPM assumptions for private companies is summarized in Table 1 below:

Table 1: Divergence of CAPM Assumptions for Private Companies

CAPM Assumption	Divergence from CAPM	Effect on CEC
Risk-aversion of the investors	Entrepreneurs are generally considered more risk taking	-
Perfect diversification	Entrepreneurs are under-diversified	+
Investors are price takers (minority interest holders)	Entrepreneurs hold the controlling packet of their company	-
Perfect marketability and divisibility	Entrepreneurs cannot sell their equity at any given time to a certain price	+
Systematic and complete information	Information is symmetric compared to publicly listed firms	0/-
Neither transaction and information costs nor taxes	For private firms the information costs are high	+

Source: Based on Khadjavi (2005), Michels (2008), and Balz and Bordemann (2007)

Risk-aversion

Usually the entrepreneurs behave all but rational and risk averse vis-à-vis their investment decisions regarding their choices of the tradeoffs between risk and return (Young and O'Byrne, 2001and Khadjavi, 2005). CAPM neglects the individual risk appetite of the entrepreneurs and thus a CAPM-derived CEC for private companies is to be critically seen (Behringer, 1999, as cited in Tappe 2009). Not the expected return of the market is of relevance but rather that of the entrepreneurs. It can be assumed that the entrepreneurs are less risk-averse (Tappe, 2009). This would mean that they are ready to take more risk without compensation of adequate return. Consequently the assumption of CAPM that for higher risk investors require higher return is not fulfilled. This results in having a lower expected rate of return from the side of the entrepreneurs as it would have been with same risk for normal market investors.

Perfect diversification

The major assumption under the CAPM model is that investors are diversified. For closely held companies such as family owned companies with limited shareholders, the owners are normally under-diversified**,** i.e. they don't or cannot invest in any desired portfolio. As the diversification is not achievable, market-derived CAPM for unlisted companies is heavily criticized (Herter, 1994). Furthermore, especially the family owners have all their assets in the company and it is highly unlikely that they have invested in other not to the family business related projects (Balz and Bordemann, 2007; Damodaran, and Herter, 1994). This results in requiring higher risk due to the additional unsystematic risks, which the entrepreneurs are undergoing (Balz und Bordemann, 2007 and Khadjavi, 2005). The owners are exposed not only to the market risk, but to the whole risk in the firm. As a result it can be argued that the capital market driven CEC for under-diversified companies should be neglected as they are underestimated (Herter, 1994).

If the investors are not diversified, it's necessary to consider and evaluate a specific risk and the individual risk preference of the entrepreneurs. However, the definition and foremost the quantification of such specific risk and its differentiation from the systematic risk is neither clear nor easy to determine. Thus, in many cases the costs of trying to do such measurements will exceed its benefits. To avoid further complication, the determination of the expected CEC for a not diversified shareholder can ultimately follow by the entrepreneur or his financial analyst. In this case, the market-derived CAPM can serve as the starting information basis with the help of which the investor decided how strong he wants to adjust for specific risk he is undergoing (Herter, 1994).

However, the diversification problem can be solved when the market Beta is adjusted. After this adjustment the Beta is called *Total Beta*. If used in the same concept the standard and not adjusted Beta is referred to as *Raw Betas*. The formula of the adjustments is as follows (Damodaran, 2002):

Formula 8: Total Beta

$$ß_{Total} = \frac{ß_{Asset}}{\rho_{jm}}$$

where $ß_{total}$ is the Beta unadjusted for diversification and ρ_{jm} is the correlation of the asset to the market.

In the case of unlisted companies, the correlation coefficient of the comparable companies is taken into the calculation (Damodaran, 2002). However, one should consider this adjustment very carefully.

In the first place, the higher risk resulting from under-diversification can be compensated by more active and committed management of the family owners[3]. However, it should be also mentioned that in the case of family owned businesses, the owners might be risk-averse in the sense of being afraid to lose the business. In such cases careful risk management, diversification through financial instruments (hedging) and avoidance of high risk projects can even result in lower risk for such families (Khadjavi, 2005). Thus, a clear conclusion regarding the diversification and risk averseness of family owned firms cannot be drawn and case-specific information is to be considered. Nevertheless, in most of the literature entrepreneurs are generally considered not to be fully diversified and being risk sympathetic compared to capital market investors (Kratz and Wangler, 2005).

Price takers

Entrepreneurs are not price takers in the sense of CAPM (Tappe, 2009). They hold the controlling packet in the company and therefore manage the company the way they wish. Therefore the assumption that the investors are price takers is also not fulfilled. It is assumed that this somewhat reduces the risk (Bucher and Schwendener, 2007). It is often argued that these reductions are balanced out with the absence of marketability of privately held shares (Khadjavi, 2005).

Marketability and illiquidity

Private companies lack marketability and illiquidity. Moreover, compared with public companies private companies have more difficulty to raise additional debt or equity capital from organized capital markets (Pratt and Grabowski, 2010). Therefore, it is assumed that the cost of equity would normally be higher for the private company and an adjustment to the CEC should be made. Due to the lack of fungibility, i.e. the impossibility of withdrawing the invested capital from the company again at any time, the

[3] A correlation has been found between higher risk and higher return of such companies which can be attributed to 1) High dependency of the equity holders makes them work harder on the company success and 2) Owners require higher returns on the investment projects because of the higher risk (Khadjavi, 2005).

CEC has to be increased. However, the relevance of the fungibility adjustment is only justified in the case of possible intention to sell the company. The illiquidity adjustments are also to be neglected when this is not expected. The underlying principle to this approach is that only the expected risks are to be taken into calculation (Dörschell et al.2009). Moreover, even if such a general adjustment were to be made, it is almost impossible to determine a justified amount of adjustment. Empirical studies have tried to find some approximation, nevertheless studies are partially very controversial and the fixed adjustment is to be rejected.

Systematic and Complete Information

In CAPM it is assumed that the investors will require additional returns due to the principal agent information asymmetry. In case of private and family owned companies the principal and the agent are one person, so that this reduces the capital costs (Khadjavi, 2005). Nevertheless, in case of integration of third-party managers, the information asymmetry can also occur in private companies (Tappe, 2009).

Transaction costs and taxes

This assumption is not realistic neither for publicly listed nor for unlisted companies. In the real world there are transactions costs as well as taxes which will bring to requiring higher capital costs. Especially for privately held companies the transaction costs are high (Michels, 2008).

Other Methods

Besides the above discussed issues regarding lack of fulfillment of CAPM assumptions for private companies, there are further specific characteristics which encourage the other methods of CEC. First, the entrepreneurs of private companies are usually described to be following not only monetary goals. The so called meta or personal goals, e.g. the consciousness to family business tradition, reputation, prestige, social recognition and etc., also have an impact on the valuation. This is sometimes referred to as emotional or family value (Bucher and Schwendener, 2007). Whereas market derived models assume purely monetary oriented investors, entrepreneurs' other preferences might result in sacrifice of short-term returns in order to secure long term business existence. This can even result in a negative cost for equity in the short-

term, which under the market driven models would be nonsense (Khadjavi, 2005).

The models (e.g. CAPM, APT) for calculating the cost of equity were introduced in order to calculate the cost of equity for publicly listed companies, where the number or the identities of the investors are normally vast. From capital market observations driven calculation cannot be completely left out from consideration. Sometimes even if the entrepreneurs are to be asked their expectations, their answers might be partially too vague (e.g. "we want as much return as possible") (Young and O'Byrne, 2001). Therefore other methods should be applied when calculating the cost of equity for private companies. Three methods are here presented and discussed, which are not based on capital market estimations. This can be quite plausible in practice especially when the above addressed problems with the commonly used mathematical methods (esp. CAPM) are taken into consideration. Moreover, many authors claim that formula cannot deliver better results than just a simple subjective estimation of the CEC (Pereiro, 2002).

Risk Components Model

In this model the cost of equity is calculated by adding different company specific risk components to the risk-free rate of return. Thus, in contrast to CAPM, unsystematic risk is also considered by taking different factors into the calculation. Hereby the basic risk free rate is increased or decreased with subjective estimations. Gleißner has developed a model for determining the adjustment to the risk free rate, which is based on the subjective evaluations from the company and not the investors form the market. Various risks are determined and with the budgeted date of the company through simulation (e.g. Monte-Carlo-Simulation) the risks are aggregated and added (Gleißner, 2005a and b).

This method is considered to be a quite plausible one especially for closely-held companies, for which due to the under diversification of the unsystematic risk is relatively high. Although this model is suitable for not listed companies sound planning data and high qualified analysts within the company will be required to be able to conduct a reasonable assessment of the CEC. The latter conditions are not always given and can be a further challenge for smaller companies.

Qualitative Approaches

In contrast to CAPM-derived models, these approaches are not based on estimating CEC based on objective comparable data, but rather attempt to subjectively estimate the relevant risk indicators (Bufka et al., 1999).
There are various scoring models, the most famous of which are the BCG and the Fuquana Inst. Method.

Figure 4: Cost of Equity Capital Estimation with BCG Matrix

Criteria	Characteristics						
	Low Risk	**1**	**2**	**3**	**4**	**5**	**High Risk**
Controllability of the profits	Low external influences						Strong external infleunces
Market	Stale, without cycles						Dynamic, cyclical
Competitors	Few, constant market shares						Many, variable market shares
Products/Concepts	Long lifecycle, not substitutable						Short lifecycle, substitutable
Market entry barriers	High						Low
Cost Structure	Low fix costs						High fix costs

Legends: 1=not so important
5=very important

Source: Own illustration based on Bufka et al. (1999)

In the BCG method the CEC for unlisted firms or divisions is derived by comparing and adjusting the CEC of the whole company, which is listed and the CEC can be calculated with CAPM. With the help of 6 criteria, the subjective judgment of the managers is required to estimate the divisional CEC (Lewis and Stelter, 1994 as cited in Bufka, et al. 1999). The Fuqua Ind. method is similar to the BCG Method and uses 14 instead of 6 criteria. The BCG method is considered as a better approach because the criteria used in BCG are more general. The study of Bufka et al. (1999) indicated that the estimation of the CEC with the BCG method has a better explanation relation with the Beta factor as the Fuqua Ind. method, especially for homogenous companies.

If the BCG method is used of unlisted companies, a starting CEC can be applied, which can for example be the average CEC of the industry and then through scoring and normalization, company specific CEC can be calculated. Alternatively, the Beta can be estimated with the help of the scoring model, by assuming the mean value of the scoring the Beta=1 and then by adjusting it according to the respective risk (Herter, 1994).

For the Qualitative Approaches the management of the company in subject can be questioned and their subjective judgments of the company's risks

are taken into consideration. The main problem of scoring models is the starting point of the adjustment. In scoring models the criteria are used to compare the risk, i.e. cost of equity with another company. These models are more adequate for determining the divisional/ or subsidiary cost of equity in case the overall cost of equity for the parent company is already determined. In this case with the help of scoring, one can determine whether the divisions have a higher or lower risk compared to the parent, and adjustments can be carried out. On the contrary, for estimation of the CEC for the private company a very similar company's CEC has to be found. In practice this can be difficult, as it is the case with the Pure-Play method in terms of finding a company similar with the risk portfolio, having the same regional activities and being public.

A further problem of the qualitative approaches is the weighting proportion of each risk criteria. It's questionable that each of the risk categories would lead to the same change in the CEC. Existing literature recommends using the same weighting for each of the category. Here it is proposed to ask the managers also to evaluate the importance of each of the category and through scaling this can be normalized and the weighting proportions of each of the category can be adjusted.

Figure 5: Determination of Weighting each Criteria of the BCG Matrix

How important do you consider each of the categories for the development of your business?

		1	2	3	4	5
Controllability of the profits						
Market						
Competitors						
Products/Concepts						
Market entry barriers						
Cost Structure						

Legends: 1=not so important
5=very important

A further challenge of scoring models is the determination of the deduction and the increase of the basis value and determination of the basis value itself. Therefore, often this is done in approximation and is therefore very subjective (AF, 1996).

Direct Questioning

Besides capital market derived approaches the cost of equity can be estimated with the help of the, so called, "Individual Approach" or "Direct Questioning" (Weber et al., 2004). Analogy Approaches can serve as an orientation tool. According to this model direct questioning of the

entrepreneurs, independent from capital markets is applied in all the cases where it is possible. Important for this approach, is the consideration of the risk-aversion of the entrepreneurs and their under- diversification (Tappe, 2009). It can be generally assumed that the entrepreneurs are more risk-friendly, thus require fewer premiums for the higher risk. Here the opportunity cost of capital does not play any role (Tappe, 2009). If there is more than one owner, the expected return of each owner can be weighted according to their equity share to arrive at an overall cost of equity capital (Khadjavi, 2005).

Table 2: Cost of Equity by Direct Questioning (Example)

Shareholders	Part in Equity	Expected Return	Weighted
Shareholder 1	55%	7,5%	4,1%
Shareholder 2	24%	9,2%	2,2%
Shareholder 3	16%	5,0%	0,8%
Shareholder 4	5%	7,5%	0,4%
Total expected return on equity			7,51%

The company owners can be asked to give their expected return on the invested capital. In order to better explain the plausibility of their answer additional questions can be prepared to proof their risk appetite.

In the classical finance theory the cost of equity is higher than the cost of debt, as the equity holders are liable in case of bankruptcy. This is not the case for family owners, as the equity is seen as a controllable capital. Therefore the equity cost can be even lower as the debt costs (Bühler, 2005). As risk is a very subjective measure, there is no universal understanding how the risk appetite could be precisely measured. Nevertheless, to compare the risk appetite of private company owners, the shareholders can be asked to choose one out of three investment alternatives. The investment alternatives with different probabilities of occurrence and returns can be suggested. An example of such questioning is presented below:

Table 3: Investment Alternatives

Investment alternatives				Answers			
	Return	Prob.		Shareholder 1	Shareholder 2	Shareholder 3	Shareholder 4
Alternative 1	15%	10%			X		
Alternative 2	10%	60%		X			
Alternative 3	5%	90%				X	X
Expected Return				1,5%	6,0%	4,5%	6,0%

4 Conclusions

This paper contributes to the literature, which argues that capital market derived methods though rooted for calculation of cost of equity capital in listed companies, may not be the best approach for private companies. Subjective approaches of cost of equity capital can be applied in case of private companies saving further assumptions and complexity in already doubtful and assumption flooded finance formulas, the most common of which is the CAPM. Whereas the Beta factor can be adjusted in numerous ways in order to be applicable for private companies, the authors challenge such approaches. Whereas it can be argued that the suggested subjective methods will be biased and therefore are useless in finance calculations, we argue that CAPM either does not deliver unbiased and objective calculation methodology and far most not for private companies. If the financial analysts are able to make the notion of cost of equity understandable and transparent to the company owners and the management, together a reasonable cost of equity capital and thus cost of capital can be agreed upon. Most importantly, CEC should consider the business and finance risk of the company and represent the expected return on the invested equity by the entrepreneurs.

Further related research topics can be empirical studies of private companies and their perception, acceptance and use of cost of equity capital. Furthermore, case studies of hands-on calculation of CEC for companies from broad business spectrum would help this research field.

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