The Cost of Capital for the Closely-held, Family-Controlled Firm

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Abstract

This paper presents a model of the cost of capital for the family-controlled, closely held firm. This model applies capital market theory to derive a cost of capital appropriate to apply to a closely held, private firm based on the total risk faced by the undiversified investor. The model shows that the cost of capital is higher for closely held firms. It also derives a Private Company Discount based on the cost of capital model. An implication of this model is that “Family Effect” should be modeled in the cash flow projections and not as an adjustment to the cost of capital.

Key Words:

Cost of Capital
Family Controlled Firm
Closely Held
Private Company Discount
Undiversified Investor
Total Risk
Family Effect
The Cost of Capital for the Closely-held, Family-controlled Firm

The typical family controlled firm is privately held and its owner(s) are not diversified. Because they typical owners of family controlled firms are not diversified, they bear the total risk associated with their company. The typical shareholders of a publicly traded company are diversified and therefore are exposed to the company’s systematic risk. Systematic, or market, risk is only part of the total risk of a company. The other component of total risk is nonsystematic, or company-specific risk. Thus, based on accepted capital market theory, the cost of capital for the undiversified owners of privately held companies should be higher than the commonly used benchmarks based on public companies’ cost of capital data. The question is, how much higher? Knowing the appropriate cost of capital is important for strategic planning and investment decisions.

This paper addresses the issue regarding what is the appropriate cost of capital for the undiversified investor. It will develop a model of the cost of capital for the undiversified investor. It also will deal with the so-called private company discount as well as a discount for illiquidity. Further it will address the ‘family effect’ and how to measure the risk of a privately held company. The implications of the following cost of capital model suggest that most of the private company discount may be attributed to the lack of diversification of the typical owner of the private company.

In actual markets, private companies generally are less valuable than similar public companies. Das et al. (2003) examine approximately 52,000 private equity financing
rounds. They find discounts for companies receiving private equity financing range from 80%, for early stage companies to 11% for late stage companies. The authors feel that the discounts are associated with a risk premium associated with these companies. The authors comment that the extra returns from buying at a discount, are due to illiquidity and to “monitoring and mentoring (p. 23),” but they do not specify what are the separate contributions of illiquidity and “monitoring and mentoring.” Likewise, they do not address the issue of an investor’s level diversification and expected returns.

Perhaps the clearest evidence that private companies are worth less than public companies is provided by Koeplin et al. (2000). They examine 84 transactions of public and private companies and compare the differences in various pricing ratios such as multiples of EBIT, EBITDA, and Sales. They observe that private companies sell at a 20% to 30% discount to similar public companies. This is an important observation because many private companies are valued using public company comparables, which are then discounted to arrive at an appropriate private company value. The authors discuss the concept of illiquidity discount, but they do not apply it to the determination of the cost of capital.

Generally, the determination of private company discounts rests on economic and financial analogy. The analogies are not perfect, and illiquidity discounts rest on subjective criteria. Among business valuation practitioners, there are a few common approaches to determine a private company discount for a closely held company. These

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1 The small sample size of Koeplin et al. (2000) and the absence of other similar studies demonstrates the difficulty of comparing public and private company multiples to derive specific discounts. Thus this approach is not generally used.
include ascertaining discounts based on restricted stock discounts and pre-IPO discounts. Each approach contains significant weaknesses, as they are based on imperfect analogies and multiple \textit{ad hoc} assumptions. The reader will find a full overview of these approaches in Pratt (2001). Furthermore, these approaches do not address the fundamental issue of whether there is a difference in the cost of capital between private and public companies.

\subsection*{A Model of the Cost of Capital for an Undiversified Investor}

The cost of capital model presented here is based upon widely accepted capital asset pricing theory. This model goes beyond McConaughy (1999), where he addressed the issue of the cost of capital in private, family controlled firms. He argued that the theory of ‘patient capital’ is erroneous and suggested that the capital markets should serve as a benchmark for return and risk. However, McConaughy did not specify the appropriate benchmark. This article develops the notion of using a specific capital market benchmark, the Sharpe Ratio, by which to estimate the cost of capital for a closely-held firm.

Owning only a single, publicly traded stock causes the owner to hold an undiversified portfolio, which exposes him to the total risk of the company. Investors who own a diversified portfolio of stocks view the risk of a stock in terms of the risk it adds to a portfolio. The portfolio risk of a stock is called systematic risk, and this risk is less than the total risk of the stock. Scholars generally agree that systematic risk determines the cost of equity capital for public companies. This is formalized in the Capital Asset
Pricing Model (CAPM). (See Brealey et al. (2006), page 958.) Fama and French (1992) developed an empirically based, multiple factor model of the systematic risk and expected return for public companies that seems to explain stock returns better than the CAPM. Both of these models assume liquid markets and diversified investors, which are not the usual characteristics of the owners of closely held, family controlled firms.

Other things equal, an undiversified portfolio is riskier than a diversified portfolio. However, modern capital market theory assumes that for a publicly traded security, the investor is diversified. Thus, the typical investor, who is assumed to be risk averse, if given a choice between owning only one stock and a fund that holds a diversified portfolio (for example an S&P500 index fund), would choose the diversified portfolio because the reward to risk ratio is likely much higher for the diversified portfolio. This is because the typical stock is far more risky than the overall market. Statman (1987) showed that the typical stock has a return standard deviation of about 50%, whereas a diversified portfolio has a return standard deviation of about 20%. Thus, for a given return, owning a single stock is about two and a half times as risky as owning a diversified portfolio. This fact underlies the recommendation to diversify, in order to reduce exposure to the risk of owning one stock. Therefore, if a typical investor must choose between a typical diversified stock investment and a typical undiversified stock investment, that investor will choose the diversified investment – unless, however, he is compensated with a higher return for taking on the extra risk associated with owning only one stock. This suggests that the family business owner will require a higher rate of return than he or she would receive by investing in a diversified portfolio of publicly
traded stocks. Thus, the cost of capital for public companies, if applied directly to closely held, family controlled firms, will underestimate their appropriate cost of capital and overestimate their values.

Crutchley and Hansen (1989) observed that managers owned more company stock when their company’s reward-to-risk ratio was higher. They used the company’s Sharpe Ratio, a measure of reward to risk of the company’s stock, as a proxy for the loss of diversification coming from holding company stock in an undiversified portfolio, since the ratio of return to risk of a single stock is almost always lower than that of the overall stock market, consistent Statman’s observations. (The Sharpe Ratio was developed by William F. Sharpe (1966), who won the Nobel Prize in Economics for his work in capital asset pricing theory.) Crutchly and Hansen empirically confirmed their hypothesis by observing that the greater a company’s reward to risk ratio, the more of its stock the company’s managers owned. In other words, a manager’s propensity to diversify outside his own company’s shares is reduced if the company’s reward to risk profile is closer to that of the overall market.

The Sharpe Ratio provides a benchmark for investors’ reward-to-risk tradeoff. It is the measure of the risk premium (reward) investors receive for taking on the total risk of the market (as measured by standard deviation of returns of the market). It is expressed thus:

\[
\frac{(R_m - R_f)}{\text{STDEV}_m}, \text{ where:}
\]

\[
R_m = \text{return on the market portfolio (e.g. S&P500)},
\]

\[
R_f = \text{risk free rate (e.g. treasury security), hence},
\]
(\(R_m - R_f\)) = the market risk premium, which is the return, ‘reward’ over the risk free rate for bearing the risk of the market, and 

\(\text{STDEV}_m\) = standard deviation of the market, the measure of total risk of the market.

The Sharpe Ratio serves as an important market-determined reward-to-risk benchmark. It is a benchmark because it is always possible to invest in the market portfolio and obtain that level of reward to risk. It is appropriate because it describes investors’ requirements for the extra return (reward) for bearing the market’s level of risk. It is applicable to private held, family controlled companies because their owners are exposed to their companies total risk, which is the risk measure that the Sharpe Ratio utilizes in \(\text{STDEV}_m\). This has a clear advantage in it application to private companies because it bypasses the issues associated with measuring the systematic risk used by the CAPM or Fama and French models and directly incorporates the type of risk faced by family business owners. This article applies the Sharpe Ratio to determine the cost of capital appropriate to a private firm whose owner is not diversified.

If the risk of an equity investment in a private company is higher than the market’s level of total risk, a risk averse investor will require a higher return on the private company investment in order to keep his reward-to-risk ratio equal to that of the market. Using the stock market’s reward to risk ratio as a benchmark, we can apply the Sharpe Ratio to determine the required return on an undiversified investment in security \(y\) (\(R_{yu}\)). The following must hold:

\[
\frac{(R_m - R_f)}{\text{STDEV}_m} = \frac{(R_{yu} - R_f)}{\text{STDEV}_y}.
\]
Where:

\[ R_m = \text{return on the market portfolio (e.g. S&P500)}, \]
\[ R_f = \text{risk free rate (e.g. treasury security)}, \]
\[ (R_m-R_f) = \text{the market risk premium, the reward for bearing the market level of risk}, \]
\[ R_{yu} = \text{required return an equity investment in private company } y, \]
\[ \text{STDEV}_m = \text{standard deviation of the market portfolio, and} \]
\[ \text{STDEV}_y = \text{standard deviation (risk) of a equity investment in private company } y. \]

Knowing these, we can solve for \( R_{yu} \):

\[ R_{yu} = R_f + \left( \frac{\text{STDEV}_y}{\text{STDEV}_m} \right) \times (R_m-R_f). \]

\( R_{yu} \) is the cost of capital for the undiversified investor in a private, closely held, family firm.

The discussion above shows that the cost of capital is higher for the typical investor in a private company, an undiversified investor. Campbell, Lettau, Malkiel and Xu (2001) find that a well-diversified portfolio needs at least forty stocks. It is unlikely that a private business owner will have thirty-nine other such investments diversified across industries to form a diversified portfolio.

**The Private Company Discount**

Since the private company cost of capital is higher than the public company cost of capital, the private company should sell at a discount to a similar public company. Thus, the cost of capital for the undiversified investor can be used in discounted cash flow
valuations. Often, private companies are valued using easily obtained public company pricing multiples, like price to earnings or price to sales and then the value is discounted.\(^2\)

The cost of capital model determined above can be used to determine a ‘private company discount.’ If the cost of capital for a private company is higher than for a public company, then it is worth less, other things equal. The discount is a function of the spread between the required returns for the closely held company and the publicly traded company.

Let the \(S_y\) be the Spread, which is the difference in the required returns for the fully diversified investor in security \(y\) and the required return of the fully undiversified investor in security \(y\):

\[
S_y = R_{yu} - R_y.
\]

Based on the Capital Asset Pricing Model,

\[
R_y = R_f + B_y (R_m - R_f),
\]

where

\[
B_y = \text{Beta of security } y, \text{ which is the systematic risk of security } y.
\]

In other words, \(R_y\) is the expected return on security \(y\) according to the Capital Asset Pricing Model (CAPM), which assumes that security \(y\) is held in a diversified portfolio.

Since,

\[
R_{yu} = R_f + (\text{STDEV}_y / \text{STDEV}_m) * (R_m - R_f),
\]

\[
R_y = R_f + B_y (R_m - R_f).
\]

We can expand the formula for the Spread to observe the factors that increase the Spread:

\[
S_y = [R_f + (\text{STDEV}_y / \text{STDEV}_m) * (R_m - R_f)] - [R_f + B_y * (R_m - R_f)]
\]

\[
= [(\text{STDEV}_y / \text{STDEV}_m) * (R_m - R_f)] - [B_y * (R_m - R_f)]
\]

\(^2\) This is referred to as “Guideline Public Company” method of valuation.
\[ \frac{\text{STDEV}_y}{\text{STDEV}_m} - B_y \] * (R_m - R_f).

The above shows that the spread is a positive function of the volatility of the security, \( \text{STDEV}_y \), and a negative function of the systematic risk of the security, \( B_y \).

If one assumes an indefinite life for private and public companies, then, using the Spread, it is possible to calculate the Private Company Discount, \( D \), of the private company compared to the public company.

**The Private Company Discount is:**

\[ D = \frac{S_y}{R_{yu}}. \]

**Measuring Risk**

The total risk of the private company must be estimated. There are different approaches to determining \( \text{STDEV}_y \). One way is to calculate the standard deviation of returns of a very similar public company or the standard deviations of the stocks of reasonably similar public companies and use some kind of average depending on the facts and circumstances. This is the approach favored by the Financial Accounting Standards Board for the valuation of stock options for private companies (See SFAS 123R.).

Another approach would be to estimate the volatility of the subject private company’s cash flows since it is really the volatility of cash flows that is the major risk to the undiversified family business owner. Volatility of cash flows can be based on the subject company’s past performance and projections, or based on the volatility of the cash flows
of similar public companies or a combination of the two. McConaughy and Covrig (2007) discuss an application of Monte Carlo simulations of cash flow projections to determine the expected volatility for use in a certainty equivalent approach to valuation.

**Family Effect and Corporate Control and Governance**

Dyer (2006) discusses the impact of the “Family Effect” on firm performance based on agency-theoretic and resource-based considerations. He suggests that the presence of family control can have an important impact on firm performance. This is consistent with earlier empirical studies by McConaughy et al. (1998, 2001) who show that publicly traded family controlled firms perform better than similar publicly traded non-family controlled firms. They grow faster and are more profitable. The authors attribute the difference to an amelioration of the agency conflicts between management and shareholders. Mishra and McConaughy (1999) find that family control is associated with significantly lower leverage in family controlled firms, which they attribute to the family’s risk aversion arising from their undiversified wealth and human capital. The “Family Effect” manifests itself in the operational characteristics of a family controlled company, which includes the level of, and risk of, the cash flows.

The cost of capital model presented here does not, and should not, incorporate a “Family Effect.” The cost of capital is based only on the total risk of the cash flows. The “Family Effect” is the family’s impact on the operations of their company. The impact of the “Family Effect” should be incorporated into the projections of cash flow and its impact on a company’s risk as suggested by the empirical studies of family controlled firms.
**Illiquidity Discounts**

The model presented here takes into account only the discount associated with a lack of diversification due to a higher cost of capital. As such, it may not provide the total discount that is appropriate to a private company. Based on the Author’s experience, the magnitude of the impact of a lack of diversification is relatively large and may explain most of the private company discount. There may be an additional discount for pure illiquidity, such as the cost associated with selling or going public. This pure illiquidity discount associated with a private may be relatively small, perhaps as Bajaj et al. (2001) suggested. Bajaj et al. erred in assuming that their illiquidity discount is the only factor affecting the private company discount by not considering the impact of lack of diversification.

**Conclusion**

This article provides a model to determine the cost of capital for private, closely-held companies. The cost of capital derived from this model serves as an important benchmark. It can be used in capital budgeting and valuation decisions by family business owners when discounted cash flow models are used. The model also provides a way to derive a private company discount using public company data. The private company discount can be applied to a comparable publicly traded company’s market value multiples, such as price to earnings, price to book or price to sales.
The private company cost of capital and discount are associated with the risk of holding an undiversified portfolio. The additional impact of pure liquidity also needs to be considered, and this is still a subject worthy of additional research.

**Appendix: Adjustment for Partial Diversification**

A partially diversified investor is not as exposed to a company’s risk as is an undiversified investor, and thus, the required return would be lower than that of an undiversified investor. Such an investor may be a conglomerate family business.

Let \( R_{yp} \) be the extra return premium for a partially diversified investor in the stock of private company \( y \):

\[
R_{yp} = \left[ \frac{1}{w} \right] \times \left[ \frac{(STDEV_p - STDEV_m)/STDEV_m}{(1 - B_y)} \right] \times (R_m - R_f)
\]

Where:

- \( w \) = weight of portfolio in security \( y \),
- \( B_y \) = Beta of security \( y \), and
- \( STDEV_p \) = standard deviation of the partially diversified portfolio.

This model assumes that the remainder of the portfolio not in \( y \) is in a diversified market portfolio, like an index fund. This model might also be used by private equity funds that invest in many private companies.
References:


