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Рецензенти:

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доц. д-р Теодора Георгиева
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ОЦЕНКА НА ТЕКУЩАТА КАПИТАЛОВА СТРУКТУРА

доц. д-р Александър Костадиновски
ас. Благица Йованова
Университет "Гоце Делчев", Щип, Република Македония

ESTIMATING CURRENT CAPITAL STRUCTURE

Aleksandar Kostadinovski
Blagica Jovanova

РЕЗЮМЕ: Кредитори и акционери очакват да бъдат компенсирани за разходите им при инвестиране на средства в един определен бизнес, вместо в други, с равностоен риск. Изчислената средна стойност на капитала, е сконтовият процент, или необходимото време, вложени в конвертиране на очаквания свободен паричен поток в настояща стойност за всички инвеститори. Най-важният основен принцип при изчисляване средната стойност на капитала е, че тя трябва да бъде в съответствие с цялостния метод на оценка и с определяне на паричния поток, който трябва да бъде сконтиран. Този документ описва първата стъпка в разработването на оценка на WACC, т.е. определяне на капиталова структура на оценяваната компания.

КЛЮЧОВИ ДУМИ: средна стойност на капитала, паричен поток, капиталовложители, пазарна стойност, не капиталово финансиране, капиталово финансиране, инвестиционен риск

INTRODUCTION

The primary role of the financial manager is to ensure that his company has a sufficient supply of capital. The financial manager is at the crossroads of the real economy, with its industries and services, and the world of finance, with its various financial markets and structures. There are two ways of looking at the financial manager's role: a buyer of capital who seeks to minimise its cost, i.e., the traditional view; a seller of financial securities who tries to maximise their value. Transactions that take place on the capital markets are made up of the following elements: a commodity: money; and a price: the interest rate in the case of debt, dividends and/or capital gains in the case of equities. In the traditional view the financial manager is responsible for the company's financial procurement. His job is to minimise the price of the commodity to be purchased, i.e., the cost of

the funds he raises. The question that lies at the heart of this paper is whether there is an optimal capital structure, one in which the combination of net debt and equity maximises enterprise value. In other words, is there a capital structure in which the weighted average cost of capital (WACC) is the lowest possible? The general formula for estimating the after-tax weighted average cost of capital (WACC) is simply the weighted average of the marginal after-tax cost of each source of capital:

$$WACC = k_b\left(1-T_c\right)\left(B/V\right)+k_p\left(P/V\right)+k_s\left(S/V\right) \text{ where}$$

kb = the pretax market expected yield to maturity on noncallable, nonconvertible debt,

Tc = the marginal tax rate for the entity being valued,

B = the market value of interest-bearing debt,

V = the market value of the enterprise being valued (*V* = *B* + *P* + *S*),

kp = the after-tax cost of capital for noncallable, nonconvertible preferred stock (which equals the pretax cost of preferred stock when no deduction is made from corporate taxes for preferred dividends),

P = the market value of the preferred stock,

ks = the market-determined opportunity cost of equity capital, and

S = the market value of equity

We have included only three types of capital (nonconvertible, noncallable debt; nonconvertible, noncallable preferred stock; and equity) in this formula. The actual weighting scheme may be more complex, because a separate market value weight is required for each source of capital that involves cash payments, now or in the future. Other possible items include leases (operating and capital), subsidized debt (for example, industrial revenue bonds), convertible or callable debt, convertible or callable preferred stock, minority interests, and/or warrants and executive stock options. A wide variety of unusual securities – for example, income bonds, bonds with payments tied to commodity indexes, and bonds that are extendable, puttable, or retractable – may also be included.

The approach we describe in this paper provides a technically correct estimation of WACC. Estimating the costs for many sources of capital is not very precise and the specific instruments used by the company will change. In practice, we often make simplifying assumptions. For example, we rarely distinguish between callable and noncallable debt in a company's capital structure because the cost differences are small and it is impossible to say what the mix of these instruments will be.

Non-interest-bearing liabilities, such as accounts payable, are excluded from the calculation of WACC to avoid inconsistencies and simplify the valuation. Non-interest-bearing liabilities have a cost of capital, just like other forms of debt, but

this cost is implicit in the price paid for the goods generating the liability and shows up in the company's operating costs and free cash flow. Separating the implied financing costs of these liabilities from operating costs and free cash flow would be complex and time-consuming without improving the valuation. The three related steps involved in developing the discount rate, or WACC are:[1]

1. Developing market value weights for the capital structure.
2. Estimating the opportunity cost of nonequity financing.
3. Estimating the opportunity cost of equity financing.

DEVELOPING MARKET VALUE WEIGHTS FOR THE CAPITAL STRUCTURE

The first step in developing an estimate of the WACC is to determine a capital structure for the company you are valuing. The theoretically correct approach to capital structure is to use a different WACC for each year that reflects the capital structure for the year. In practice, we usually use one WACC for the entire forecast. Where possible, we should estimate market values of the elements of the current capital structure and review how they have changed. The best approach is to identify the values of the capital structure elements directly from their prices in the marketplace. If a company's common stock and debt are publicly traded, simply multiply the number of each type of outstanding security by its respective price in the marketplace. Most of the difficulty arises because sources of funds often are not traded in a marketplace where we can observe their prices directly. Be prepared to deal with these categories of financing:

1. *Debt-type financing* – financing forms in this category normally obligate the company to make a series of payments to the holders of the outstanding instruments, according to a payment schedule stipulated in the financing documents. Interest, coupon, or dividend payments may be fixed or variable. In this category fall short-term and long-term debt, leases, and some preferred stock. Their value depends on three factors: the agreed-upon payment schedule, the likelihood the borrower will make the payments as promised, and the market interest rates for securities with a similar pattern of expected payments.

Generally, their market value can be approximated without difficulty. The process is as follows:

1. Identify the contractually promised payments. Is the financing instrument a variable-rate note with interest determined each six months at a fixed spread over the prime rate, or a 20-year zero-coupon bond?

2. Determine the credit quality of the instrument to be valued. Credit ratings are often available for even illiquid issues, or can be estimated from ratings on

[1] Pascal Quiry, Yann Le Fur: Corporate Finance, John Wiley & Sons Ltd, 2005, p. 215.

other company borrowings (adjusting for the security of the specific instrument in bankruptcy) or from bond rating models that attempt to mimic the behaviour of the rating agencies. Estimate the yield to maturity for which the instrument would trade were it publicly traded, by reference to market yields on securities with equivalent coupons, maturities, and ratings.

3. Calculate the present value of the stream of financing payments, using the yield to maturity on an equivalent issue as the discount rate. The resulting present value should approximate the market value. (This is equivalent to discounting expected payments at the expected market equilibrium rate of return.)

This approach will work well in most cases, but a few special situations might call for a different approach:

- *Option features.* Interest rate option features such as "caps", "floors", and call provisions have an effect on future payments, depending on the level of interest rates. They therefore affect the value of the security that contains them. There are two approaches to adjust for these features. The first is to find a comparable security with a similar feature and use it as a proxy. The second is to use an option-pricing approach to estimate the value of the option feature separately.
- *Swaps.* Many companies enter into interest-rate and currency swap agreements that change the duration and/or currency profile of their financing. Swaps are off-balance-sheet transactions that are disclosed in the footnotes to the financial statements. They are also sometimes used by corporations to speculate on interest rates. A company could have a debt swap outstanding even though it is financed entirely with common equity.

For valuation purposes, swaps should be treated in the same way as any other financing instruments, with the promised cash flow in the agreement valued at the prevailing market rate. This can be a complicated and nearly impossible to do without specific information about the swap instruments themselves. If we associate swap with a specific outstanding instrument, we should estimate the value of the "synthetic" security that the combination of the security plus swap creates. A company may have issued floating-rate debt and entered into an interest-rate swap that converts it to a five-year fixed rate instrument. In this case, estimate the value of the five-year instrument using the standard procedure noted earlier.

- *Foreign currency obligations.* If a company has financing outstanding in a currency other than its home currency, the value of this financing will need to be stated in terms of the company's home currency. This involves a two-step process. First, value the debt in foreign currency terms according to the standard procedure. Second, translate the resulting foreign currency market value into the home currency by using the spot foreign exchange rate.
- *Leases.* Leases substitute for other forms of debt and can therefore be treated like debt. Standard accounting principles divide leases into two classes:

capital leases and operating leases. Capital leases are essentially those that transfer most of the ownership risk of the asset to the lessee. All other leases are considered operating leases. Capital leases are accounted for as if the lessee had purchased the asset and borrowed the funds. The present value of the lease payments is added to the company's assets with other fixed assets and to the liability side of the balance sheet alongside other debt. Operating leases do not appear on the balance sheet, and the lease payments are included with other operating costs. While the accounting treatment of capital and operating leases differs, the economics of the two types of leases is often similar. Some companies carefully structure leases to keep them off the balance sheet, but the accounting treatment should not drive valuation analysis.

Since capital leases are already shown as debt on the balance sheet, their market value can be estimated just like other debt. Operating leases may also be treated like other forms of debt. The market value of an operating lease is the present value of the required future lease payments (excluding the portion of the lease payment for maintenance) discounted at a rate that reflects the riskiness to the lessee of the particular lease. (Required future lease payments on both capital and operating leases are disclosed in the financial statement footnotes if they are significant.) If operating leases are not significant, we should not bother to treat them as debt. We should leave them out of the capital structure and keep the lease payments as an operating cost.

2. Equity-linked/hybrid financing. Companies commonly have, in addition to fixed-income obligations, financing that has all or part of its return linked to the value of all or part of the business. These financing forms include warrants, employee stock options, convertible debt, and convertible preferred stock. When these securities are traded, their market value should be determined from their current market prices. When they are not traded, estimating their market value is more difficult than is the case with the fixed-income obligations.

- *Warrants and employee stock options.* Usually warrants represent the right to buy a set number of shares of the company's equity at a predetermined price. They can also be warrants to purchase other types of securities, such as preferred stock or additional debt. Warrants are essentially long-term options having an original issue exercise period of five to ten years, with a strike price equal to the price the holder would pay, on exercise, to acquire the underlying security. Since they are options, warrants should be valued using option-pricing approaches. If the company you are valuing has a large number of warrants or employee stock options outstanding, their cost should be included in the company's WACC.
- *Convertible securities.* Convertible securities represent a combination of straight, nonconvertible financing and a specified number of warrants that comprise the conversion feature. Their value and true opportunity cost cannot be determined properly without recognizing the value of the conversion feature (warrant). The stated interest rate on these issues is lower than on straight-debt

equivalents because the conversion feature has value. Investors are willing to pay for this value by foregoing the higher yield available on nonconvertible securities. The deeper in the money it is, the lower the traded yield, and vice versa. Since each convertible bond is a portfolio of straight debt and warrants, the true opportunity cost is higher than for straight debt but lower than for equity. To deal with convertible securities in a company's capital structure, follow an approach similar to the one used for warrants.

3. Minority interests. Represent claims by outside shareholders on a portion of a company's business. Minority interests usually arise after an acquisition when the acquiring company does not purchase all of the target company's shares outstanding. They can also arise if the company sells a minority stake in one of its subsidiaries to a third party. The treatment of minority interests depends on the information available. If the minority shares are publicly traded, then their approximate value can be determined directly from the market prices for the shares. If, as is more often the case, the shares are not traded, then theoretically we should value the subsidiary separately using the discounted free cash flow valuation approach and compute the value of the minority stake according to the percentage of the subsidiary's shares the minority shareholders own. If information about the subsidiary's free cash flow cannot be developed, then the value of the minority stake could be approximated by applying price-to-earnings or market-to-book ratios for similar companies to the minority's share of income or net assets. Both of these items are disclosed in the financial statements – sometimes separately for each subsidiary in which a minority interest exists.

4. Preferred stock. Holders of preferred stock receive preferred dividends perpetually. In bankruptcy, payments to preferred shareholders are subordinate to those of bondholders, but senior to payments to equity holders. Preferred stock is riskier than debt but less risky than equity, and its cost of capital will be between these two extremes. If the preferred stock is not callable or convertible then the cost of preferred can be estimated by dividing the annual dividends by the current stock price.

5. Common equity. If a traded market for the company's common shares exists, follow the familiar approach of using current market price multiplied by the number of shares outstanding. If a traded market does not exist, you can develop an implied equity value by testing alternative values for the equity and the implications they would have for the market value weights in the WACC computation. These alternative weights can be used to develop estimates of the cost of capital, and can be refined through iterations. When the value of equity used in the WACC formula is approximately equal to the discounted cash flow value of equity produced by applying the discount rate to the free cash flows and the continuing value, and then we have an implied economic capital structure for the business.

In addition to estimating the market-value-based capital structure of the company, we should also review the capital structures of comparable companies. The benefits are:[2]

- It will help us understand whether our current estimate of capital structure is unusual. For the company's capital structure to be different is perfectly acceptable, but we should understand the reasons why it is or is not. For instance, is the company by philosophy more aggressive or innovative in the use of nonequity financing, or is the current capital structure only a temporary deviation from a more conservative target? Often, companies finance acquisitions with debt that they plan to pay down rapidly or refinance with a stock offering in the next year. Alternatively, is there anything different about the company's cash flow or asset intensity that means that its target capital structure can or should be fundamentally different from those of comparable companies?
- Another reason for reviewing comparable companies is a more practical one. In some cases we cannot directly estimate the current financing mix for the company. For privately held or thinly traded companies or for divisions of a publicly traded company, a market-based estimate of the current value of equity many not are available. In these situations, we use comparables to help assess the reasonableness of the estimate of the target proportion of equity development through the iterative process described in the previous section.

Where possible, we should try to determine whether the company's managers have an explicit or implicit target capital structure that is different from the current capital structure. If the managers' target is different than the current capital structure, we should use it if we believe that it is realistic and achievable within the next few years.

CONCLUSION

From a financial point of view, a company's aim is to create value; i.e., it should be able to make investments on which the rate of return is higher than the required rate of return, given the risk involved. If this condition is met, the share price or the value of the share will rise. If not, it will fall. Whereas frequent disequilibria in industrial markets allow hope of creating value through judicious investment, the same cannot be said of choosing a source of financing. Financial markets are typically close to equilibrium, and all sources of financing have the same cost to the company given their risk. The cost of financing to buy an asset is equal to the rate of return required on that asset, regardless of whether the financing is debt or equity and regardless of the nationality of the investor. We

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[2] Tom Copeland, Tim Koller, and Jack Murrin: *Valuation: Measuring and Managing the Value of Companies*, McKinsey & Company, Inc., p. 345.

consider the weighted average cost of capital (WACC), to be the rate of return required by all the company's investors either to buy or to hold its securities. It is the company's cost of financing and the minimum return its investments must generate in the medium term. If not, the company is heading for ruin.

According to conventional wisdom, there is an optimal capital structure that maximises enterprise value by the judicious use of debt and the leverage it offers. This enables the company to minimise its weighted average cost of capital – that is, the cost of financing. For an investor with a perfectly diversified portfolio, and in a tax-free universe, there is no optimal capital structure. The following rules can be formed on the basis of the above: 1) for any given investment policy and if no taxes are levied, value cannot be instantly created by the choice of a "good" capital structure; 2) whether a given company is sold and the deal is paid in shares only, or whether the deal is paid in a whole range of different securities (shares, debt, hybrid shares), this will not change the value of its operating assets (excluding tax); 3) in a world without taxes, the expected leverage effect is an illusion. The cost of capital (excluding tax) is linked to the company's assets and is independent of the method of financing.

It follows that the choice of source of financing is not made on the basis of its cost (since all sources have the same risk-adjusted cost!). Apparent cost must not be confused with financial cost (the true economic cost of a source of financing). The difference between apparent cost and financial cost is low for debt; it is attributable to the possibility of changes in the debt ratio and default risk. The difference is greater for equity owing to growth prospects; greater still for internal financing, where the explicit cost is nil; and difficult to evaluate for all hybrid securities. Lastly, a source of financing is cheap only if, for whatever reason, it has brought in more than its market value.

Because there is no optimal capital structure, the choice between debt and equity will depend on a number of considerations:[3]

- Macroeconomic conditions. High real (inflation-adjusted) interest rates and low activity growth will prompt companies to deleverage. Inversely, rapid growth and/or low real interest rates will favour borrowing.
- The desire to retain a degree of financial flexibility so that any investment opportunities that arise can be quickly seized. To this end, equity financing is preferred because it creates additional borrowing capacity and does not compromise future choices. Inversely, if current borrowing capacity is used up, the only source of financing left is equity; its availability depends on share prices holding up, which is never assured.
- The maturity of the industry and the capital structure of competitors. A start-up will get no financing but equity because of its high specific risk, whereas

[3] F. Bancel, U. Mittoo, The determinants of capital structure choice: A survey of European firms, Financial Management, Winter 2004, p. 56.

an established company with sizeable free cash flows but little prospect of growth will be able to finance itself largely by borrowing. Companies in the same business sector often mimic each other (what matters are to be no more foolish than the next guy!).

- Shareholder preferences. Some will favour borrowing so as not to be diluted by a capital increase in which they cannot afford to participate. Others will favour equity so as not to increase their risk. It is all a question of risk aversion.
- Financing opportunities. These are by definition unpredictable, and it is hard to construct a rigorous financing policy around them. When they occur, they make it possible to raise funds at less than the normal cost – but at the expense of the investors who have deluded themselves.

The reader who performs simulations of the principal financial parameters, differentiating according to whether the company is using debt or equity financing should be fully aware that such simulations mainly show the consequences of financial leverage: raising the breakeven point; accelerating EPS growth; increasing the rate of return on book equity; degrading solvency; affecting liquidity in a way that varies with the term of the debt. Once the company has decided about the debt/equity mix, the financial manager should focus his attention on the other elements that define the "design" of the capital structure. Design of a capital structure is somehow similar to the definition of "financial architecture" used by S. Myers: "financial architecture means the entire financial design of the business, including ownership (e.g. concentrated vs. dispersed), the legal form of organization (e.g. corporation vs. limited-life partnership), incentives, financing and allocation of risk."[4] The most important factors determining the design of the capital structure are the maturity, basis and currency structure. The choices regarding these three aspects can be done following the same principle – the "matching principle" or the "hedging principle" – according to which the optimal design of debt is the one that perfectly matches cash inflows and cash outflows.

REFERENCES

1. S. Myers, Financial architecture, European Financial Magazine, 5(2), 1999.
2. F. Bancel, U. Mittoo, The determinants of capital structure choice: A survey of European firms, Financial Management, Winter 2004.
3. Tom Copeland, Tim Koller, and Jack Murrin: *Valuation: Measuring and Managing the Value of Companies,* McKinsey & Company, Inc.
4. Pascal Quiry, Yann Le Fur: Corporate Finance, John Wiley & Sons Ltd, 2005.

[4] S. Myers, Financial architecture, European Financial Magazine, 5(2), 1999, p. 133-141.

5. F. Modigliani, M. Miller, The cost of capital, corporation finance and the theory of investment, American Economic Review, 47, 2006.
6. A. de Miguel, J. Pindado, Determinants of capital structure: New evidence from Spanish panel data, Journal of Corporate Finance, 7, 2007.