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THE IMPACT OF FINANCIAL LEVERAGE ON RETURN AND RISK

Hakan SARITAŞ(*)

ABSTRACT

Financing with debt and preferred stock to increase the potential return to the residual common shareholders' equity is referred to as financial leverage. A firm's return on equity (ROE) is a key determinant of the growth rate of its earnings. Return on equity is affected profoundly by the firm's degree of financial leverage. Increased debt will make a positive contribution to a firm's ROE only if the firm's return on assets (ROA) exceeds the interest rate on the debt. In spite of the fact that financial leverage increases the rate of return on common stock equity, the grater the proportion of debt in the capital structure, however, the greater the risk the common shareholders bear. Introduction of financial leverage increases the average profitability of the firm as well as its risk. In good economic years, the impact of financial leverage will most likely be positive; however, the leverage effect may be negative in relatively bad years. Traditionally, studies treated short-term debt and long-term debt as perfect substitutes for each other. There is, however, risk-sharing by long-term debtholders which makes short-term debt financing riskier to shareholders than long-term debt financing. The significant affect associated with the total debt usage is largely attributable to short-term debt financing, since the impact of short-term debt financing on the expected returns is shown to be greater than that of long-term debt financing.

Keywords: Risk, ROE, ROA, Business Risk.

1. Introduction

A firm has a certain amount of risk inherent in its operations related to general economic conditions in which it operates. Business risk or economic risk is a function of general economic conditions and is not related to the firm's financial structure.

Financial risk is, on the other hand, the additional risk placed on the common stockholders as result of the decision to finance with debt and/or preferred stock. Stockholders already face a certain amount of risk inherent in the firms operations, business risk; financial risk is the additional variability in earnings induced by leverage.

The decision of a firm to enter a particular line of economic endeavor or to

(*) Araş.Gör., D.E.Ü.Sosyal Bilimler Enstitüsü, Buca-İZMİR

undertake a particular investment program affects its economic risk; the decision to finance the investment, partially or completely, with debt determines the firm's financial risk.

While the general level of interest affects the behavior of all firms, there are also characteristics unique to individual firms which can explain why one firm will decide to issue equity, while another will issue debt or preferred stocks.

This paper will examine financial leverage in variety of aspects, including how financial leverage is created, relationship between financial leverage and returns, how financial leverage affects returns and risk, how financial leverage differs from operating leverage, and factors affecting the level of financial leverage.

2. Business Risk

A firm's business risk or economic risk is related to the industry to which it belongs and to the general conditions of the economy (Levi and Sarnat, 1994: 375). In other words, business risk is the riskiness of the firm's assets if it uses no debt. Conceptually, the firm has a certain amount of risk inherent in its operations related to the economic conditions in which it operates. For example, the business risk of public utilities is usually significantly less than that of manufacturing firms. This reflects the tendency for fluctuations in the demand for the services provided utilities, such as telephone companies, to be small relative to those experienced by industrial firms, demand for whose products tends to be more unstable.

Business risk is a function of general economic conditions and is not related to the firm's financial structure. Business risk is measured by the uncertainty inherent in projections of a firm's future rate of return on assets (ROA) that will be explained in more detail later in the paper. Thus, business risk can be measured by the standard deviation of return on assets (ROA).

Business risk varies not only from industry to industry but also among firms in a given industry. Further, business risk can change over time. For example, the electric utilities were regarded for years as having little business risk, a combination of events in the 1970s and 1980s altered the utilities' situation, producing sharp declines in their return on equity (ROE) and greatly increasing the industry's business risk. Now, food processors and grocery retailers are frequently given as examples of industries with low business risk, while cyclical manufacturing industries such as autos, and steel are regarded as having especially high business risk. Also, smaller companies, and those that are dependent on a single product, are often regarded as having a high degree of business risk (Brigham and Gapenski, 1994: 523).

Business risk depends on a number of factors; the important ones are listed below (Brigham and Gapenski, 1994: 523):

1. Demand variability. The more stable the demand for a firm's products, other things held constant, the lower its business risk.

2. Sales price volatility. Firms whose products are sold in highly volatile markets are exposed to more business risk than similar firms whose output prices are more stable.

3. Input cost variability. Firms whose input costs are highly uncertain are exposed to a high degree of business risk.

4. Ability to adjust output prices for changes in input costs. Some firms are better able than others to raise their own output prices when input costs rise. The greater the ability to adjust output prices to reflect cost conditions, the lower the degree of business risk, other things held constant.

5. Ability to develop new products in a timely, cost effective manner. Firms in such high-tech industries as drugs and computers depend on a constant stream of new products. The faster its products become obsolete, the greater a firm's business risk.

6. The extent to which costs are fixed: operating leverage. If a high percentage of a firm's costs are fixed, hence do not decline when demand falls off, then the firm is exposed to a relatively high degree of business risk. This factor is called operating leverage.

3. Financial Risk

Financial risk is the additional risk placed on the common stockholders as result of the decision to finance with dept and/or preferred stock (Brigham and Gapenski, 1994: 527). Stockholders already face a certain amount of risk which is inherent in a firm's operations--business risk; financial risk is the additional variability in earnings induced by leverage.

The decision of a firm to enter a particular line of economic endeavor or to undertake a particular investment program affects its economic risk; the decision to finance the investment, partially or completely, with dept determines the firm's financial risk. Clearly, stockholders are vulnerable to total risk of the firm, i.e., to the firm's business risk as well as its financial risk.

Since financial risk is related to financial leverage, there will be more to say about financial leverage later in the paper.

4. Financial Leverage

Financing with debt and preferred stock to increase the potential return to the residual common stockholders' equity is referred to as financial leverage (Maher et al, 1994: 747).

While the general level of interest rates affects the behavior of all firms, there are also characteristics unique to individual firms which can explain why one firm will decide to issue equity, while another will issue debt or preferred stocks. For example, if a firm has declining profits and is losing money and the firm's future profit potential is discouraging, then it is probably better that it issues equity. However, if a firm has stable income and a bright future, it can sustain increasing debt. Thus, the brighter the forecast, the smaller the probability that net operating income will be less than the interest to be paid to lenders, and the greater the firm's incentive to issue bonds. This reasoning explains why, for a given interest rate, we observe one firm issuing bonds and the other in the same industry issuing equity.

In the most traditional of theories on the weighted average cost of capital, introducing debt leverage into a firm's capital structure initially reduced the borrower's overall cost of capital. This was due to the deductibility of interest on debt versus the higher non-tax-shielded cost of capital for new equity or retained earnings. However, at some point (Whether it was 25-,50-, or 75-percent leverage) investors' fear of financial distress took over, and the increased cost of equity and debt outweighed the tax advantages derived from increased leverage. Thus, the theory went, capital cost-minimizing(and value-maximizing) entities should add to their debt only up to the point where the present value of tax savings due to the additional borrowing is just offset by increase in the present value of the cost of distress. Each company and industry had its optimum point for minimizing cost of capital, depending on the business-risk characteristics of that industry. It could be anywhere between 0-and 100-percent debt, depending on asset liquidity, cash flow generating stability, and so on (Hart, 1994: 33).

The bottom line is that cost of capital is a function of current market perceptions of risk, is temporary and changeable, and hence should not be a basis for long-term legislative or regulatory decisions. Acceptable debt leveraging varies with time and is subject to the demands of a changing market, which continuously affects relative capital costs (Hart, 1994: 35).

In reality, a firm's long-term financing policy can be influenced by a variety of considerations. Among these are the following (Levy and Sarnat, 1994: 381):

1. Location of earnings distribution, 2. Stability of sales and earnings, 3. Risk of bankruptcy, 4. Dividend policy, 5. Control, and 6. Agency cost.

1. Location of earnings distribution. The willingness of a firm to accept the increased risk which is engendered by the use of financial leverage depends on the characteristics of the distribution of earnings. Firms with relatively high rates of operating profit can better afford to undertake the risk of employing greater leverage, which in turn further magnifies their net earnings. Financial leverage, on the other hand, can be dangerous strategy when employed by a firm with an inadequate operating profit base.

2. Stability of sales and earnings. Another key factor which determines the range of earnings, and hence the amount of debt that the firm borrows is the stability of sales, which in turn influences the stability of operating earnings. Thus, firms with relatively stable earnings tend to finance a larger portion of their investments with debt.

3. Risk of bankruptcy. The probability of bankruptcy is another factor that affects a firm's financial structure decision. The probability of going bankrupt depends on many economic factors, two of which are the most important ones: the firm's economic and financial risks.

Since economic risk, as explained before, is associated mainly with the industry to which the firm belongs and the general conditions of the overall economy, even competent management can do very little to reduce economic risk once the underlying decision regarding the type of economic activity to be pursued is made. Financial risk. On the other hand, is subject almost completely to discretionary control of management. By reducing the use of leverage, management can decrease the variability of the firm' earnings, thereby decreasing the probability of not being able to meet charges during a series of consecutive years. By increasing the use of leverage, management also increase the firm's financial risk and thereby the probability of financial failure.

4. Dividend policy. Most firms attach great importance to achieving an unbroken dividend record; and if the dividend is cut, the market reacts unfavorably. The implication of such an objective is that for any given dividend rate, the higher the leverage ratio, other things being equal, the greater is the chance that the firm will be unable to meet its dividend payments out of current operating income.

5. Control. Sometimes, firms may resort to the use intensive leverage in order to retain effective control over the corporation. A loss of control might occur, should the company issue additional shares of stock to the public. In such a case, the firm might

prefer to use additional debt.

Financing with debt has another advantage to consider. John Howe of J. Makowski Associates, a leading project developer, says, " The financial markets effectively regulate how much debt we will be allowed for a particular project. The amount of debt a project takes on is a function of what bankers are willing to lend. A major advantage of this form of project financing is that the banker's scrutiny of the project's underlying fundamentals and quality is given up front, rather than years later after the dollars have been irrevocably spent."(Hart, 1994: 35).

6. Agency costs. The shareholders monetary loss due to the fact that the managers do not necessarily act in the best interest of the shareholders is called 'agency cost' (Levy and Sarnat, 1994: 386). A firm's managers and shareholders have different objectives, and the managers tend to be more risk averse than the shareholders because of the fact that the firm might face losses due to high leverage, which in turn, may result in a loss of their jobs. Thus, the managers choose a lower degree of leverage rather than high leverage that would maximize the value of the firm. In choosing financial leverage, top mangers know they are exposed to a higher risk, a factor which influences the selected amount of debt.

5. Performance/Profitability Measures

Three basic measures of profitability are:

1. Rate of return on common shareholders' equity, 2. Rate of return on assets, and 3. Earnings per share.

1. The rate of return on common shareholders' equity(ROE) measures a firm's performance in using assets to generate earnings. The ROE explicitly considers the financing a firm's assets (Maher et al, 1994: 744). This performance measure is of primary interest to investors in a firm's common stocks, and is calculated as follows:

ROE=(NI-Dp)/CSa, where, (5.1)

ROE=Return on Equity; NI=Net income; Dp=Dividends on preferred stock; CSa=Average common shareholders' equity.

2. The rate of return on assets(ROA) measures a firm's performance in using assets to generate earnings independent of the financing of those assets. The rate of return on assets relates the results of operating performance to the investments of a firm without regard to how the firm financed the acquisition of those investments (Maher et

al, 1994: 736).

This performance measurement excludes consideration of the particular mix of financing, and is calculated as follows:

ROA=(NI+IE)/TAa, where, (52)

ROA=Return on Equity; NI=Net Income; IE=Interest Expense Net of Income Tax Savings; TAa=Average Total Assets.

The ROA is important for lenders and common shareholders who find it useful in assessing financial leverage.

3. Earnings per share of common stock equals net income attributable to common stock divided by the average number of common shares outstanding during the period (Maher et al, 1994: 750).

6. Financial Leverage And Returns

We have indicated that business risk is the risk a firm faces inherent to general economic conditions. Financial risk, on the other hand, is firm-specific risk due to the firm's financial decision regarding to use of debt. For example, two firms in the same industry may face the same business risk, but their financial risk may differ because of different leverage in their capital structure.

The exact relationship among ROE, ROA, and leverage can be summarized as follows (Bodie et al., 1993: 590):

ROE=(1-Tax rate)[ROA+(ROA-Interest rate)(Debt/Equity)]. (6.1)

The relationship has the following implications. If there is no debt or if the firm's ROA equals the interest rate on its debt, its ROE will simply equal (1 Minus the tax rate) times ROA. If its ROA exceeds the interest rate, then its ROE will exceed (1 minus the tax rate) times ROA by an amount that will be greater the higher the debt-to-equity ratio. This result makes intuitive sense: if ROA exceeds the borrowing rate, the firm earns more on its money than it pays out to creditors. The surplus earnings are available to the firm's owners, the equity holders, which raises ROE. If, on the other hand, ROA is less than the interest rate, then ROE will decline by an amount that depends on the debt-to-equity ratio. Thus, the important point to remember is that increased debt will make a positive contribution to a firm's ROE only if the firm's ROA exceeds the interest rate on the debt.

A firm's ROE is a key determinant of the growth rate of its earnings. ROE is affected profoundly by the firm's degree of financial leverage. An increase in a firm's debt-to-equity ratio will raise its ROE and hence its growth rate only if the interest rate on the debt is less than the firm's return on assets (Bodie et al, 1993: 608).

7. Financial Leverage And Risk

Financial leverage increases the rate of return on common stock equity when the rate of return on assets is higher than the after tax cost of debt. The greater the proportion of debt in the capital structure, however, the greater the risk the common shareholders bear. Of course, a firm cannot increase debt without limit; as it adds more debt to the capital structure, the risk of default and insolvency becomes greater, lenders, including investors in a firm's bonds, require a higher and higher return to compensate for this additional risk. At some point, the after tax cost of debt will exceed the rate of return earned on assets. At this point, leverage no longer increases the potential rate of return to common stock equity. For most large manufacturing firms, liabilities represent between 30 percent and 60 percent of total capital (Maher et al, 1994: 749).

Introduction of financial leverage usually increases the average profitability of the firm as well as its risk. In good economic years, the impact of financial leverage will most likely be positive; however, the leverage effect may be negative in relatively bad years. On e of the crucial tasks of management is to attempt to evaluate the risks of leverage by forecasting the changes of 'good' versus 'bad' economic conditions. This task can be facilitated by using a special version of a well-known tool--break-even analysis--in order to simulate the impact of financial leverage on EPS for varying levels of output and sales, or alternatively, for different levels of net operating income (Levy and Sarnat, 1994: 376).

8. Short-term Debt Versus Long-term Debt

We have analyzed the impact of the debt(financial leverage) on a firm's earnings in the previous sections. However, we did not distinguish between short-term debt and long-term debt. In this section, we will analyze the leverage effect in terms of maturity of debt.

Among a few studies on the relationship between maturity structure and the cost of capital, Morris(1976) demonstrates that short-term debt with variable refinancing rates can reduce shareholder risk if the firm's net operating income and future interest rates are positively correlated. Such " cross-hedging" lowers the variability of net income and thus stabilizes the firm's cash flows to its shareholders.

However, the opposite is true when operating income and short-tern interest rates are negatively correlated. Furthermore, the predictions may be obscured if short-term interest rates and long-term rates are positively correlated, such that changes in short-term and long-term interest rates cause long-term debt value and equity value to fluctuate. Brick and Ravid(1985), on the other hand, develop a model where a long-term maturity is optimal when there is a gain from leverage and when the term structure of interest rates is upward sloping. Under the assumptions, the tax benefit of financial leverage is accelerated and maximized with the use of long-term financing. This model suggests that the cost of capital and shareholders risk is lower with long-term financing than with short-term financing (Choe, 1994: 187).

The discussion of the impact of debt maturity on the expected common stock returns relies heavily upon the presumption that short-term and long-term debts are different in terms of the risk perceived by debtholders. For a given risk level of a firm's investment activities, the risk borne by its shareholders depends on not only the degree of financial leverage but also the risk borne by other claim holders. When long-term debtholders, compared to short-term debtholders, are more exposed to risk for their investments; an increase in short-term debt displacing long-term debt will increase shareholder risk. This is because, as the firm shortens its debt maturity structure without changing the total debt ratio, the combined risks borne by short-term and long-term debtholders will decrease, and the risk borne by shareholders will increase.

Traditionally, studies have treated short-term debt and long-term debt as perfect substitutes for each other. There is, however, risk-sharing by long-term debtholders which makes short-term debt financing riskier to the shareholders than long-term financing. The greater the reliance on short-term debt financing in the capital structure, the higher will be the expected returns on common stocks for given investments and total borrowing. The total debt to equity ratio is positively related to the expected returns on common stocks. The significant effect associated with the total debt usage is largely attributable to short-term debt financing, since the impact of short-term debt financing on the expected returns is shown to be significantly greater than that of long-term debt financing (Choe, 1994: 197).

9. Financial Leverage Versus Operating Leverage

We have, earlier, indicated that a firm is exposed to financial risk due to financial leverage resulted from its capital structure; besides financial risk, the firm is also exposed to business risk because of its asset structure. Thus, the degree of operating leverage affects the degree of financial leverage a firm adopts.

If a high percentage of a firm's costs are fixed, hence do not decline when demand falls off, then the firm is exposed to a relatively high degree of business risk. This factor is called operating leverage. A high degree of operating leverage, other factors held constant, implies that a relatively small change in sales results in a large change in ROE. In general, holding other factors constant, the higher the degree of operating leverage, the greater the firm's business risk as measured by the standard deviation of its expected ROE (Brigham and Gapenski, 1994: 524, 526).

A major disadvantage of financial leverage is that it increases the variability of earnings. Hence, in establishing its financial strategy, each firm is confronted with a difficult decision regarding the amount of risk which it is willing to undertake. In this context, it is worth noting that any given risk level can be achieved in principle either by changing the firm's financial structure or by changing its asset structure. The larger the portion of its fixed assets, the greater its operating leverage, and such a firm might be expected to adopt a relatively conservative financial leverage (Levy, 1994: 387).

10. Conclusion

Financing with debt and preferred stock to increase the potential return to the residual common shareholders' equity is referred to as financial leverage. A firm's long-term financing policy can be influenced by a variety of considerations. The most important of these factors include location of earnings distribution, stability of sales and earnings, risk of bankruptcy, dividend policy, control, and agency cost.

A firm's return on equity(ROE) is a key determinant of the growth rate of its earnings. Return on equity is affected profoundly by the firm's degree of financial leverage. Increased debt will make a positive contribution to a firm's ROE only if the firm's return on assets(ROA) exceeds the interest rate on the debt.

In spite of the fact that financial leverage increases the rate of return on common stock equity, the grater the proportion of debt in the capital structure, however, the greater the risk the common shareholders bear. Introduction of financial leverage increases the average profitability of the firm as well as its risk. In good economic years, the impact of financial leverage will most likely be positive; however, the leverage effect may be negative in relatively bad years.

Traditionally, studies have treated short-term debt and long-term debt as perfect substitutes for each other. There is, however, risk-sharing by long-term debtholders which makes short-term debt financing riskier to shareholders than long-term debt financing. The significant affect associated with the total debt usage is largely

attributable to short-term debt financing, since the impact of short-term debt financing on the expected returns is shown to be significantly greater than that of long-term debt financing.

In general, holding other factors constant, the higher the degree of operating leverage, the greater the firm's business risk as measured by the standard deviation of its expected ROE. The larger the proportion of a firm's fixed assets, the greater its operating leverage, and such a firm might be expected to adopt a relatively conservative financial leverage ratio.

A firm is exposed to financial risk due to financial leverage resulted from its capital structure; besides that, the firm is also exposed to a business risk because of its asset structure.

ÖZET

Adi hisse senedi sahiplerinin sermayesinin potansiyel getirisini arttırmak için borç ve imtiyazlı hisse senedi ile finansman finansal kaldıraç olarak bilinir. Bir firmanın Özsermaye Getiri Oranı onun gelirlerinin büyüme oranının temel belirleyicisidir. Bu oran firmanın finansal kaldıraç derecesinden önemli ölçüde etkilenir. Bir firmanın Varlık Getiri Oranı sadece borç faizlerini geçtiği müddetçe borçlanma, firmanın Özsermaye Getiri Oranına pozitif bir katkıda bulunabilir.

Finansal kaldıraç adi hisse senedi sermaye getiri oranını arttırmakla beraber, sermaye yapısında borçların payı ne kadar fazla ise adi hisse senedi sahiplerinin karşılaşacağı risk te o derece artacaktır. İyi ekonomik koşullarda finansal kaldıracın etkisi büyük ölçüde pozitif olurken, nisbeten kötü ekonomik koşullarda kaldıracın etkisi negatif olacaktır.

Geleneksel olarak kısa vadeli borç ve uzun vadeli borç birbirlerinin tam ikamesi olarak düşünülürken, gerçekte kısa vadeli borç uzun vadeli borca göre hissedarlara daha fazla risk yükler.

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