Management and Control of Debt Financing Risk: A New Perspective

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Abstract—By introducing the relationship between DFL and ICR, the paper proposes a new model for analyzing financing risk management. Based on the data of Chinese industrial companies in 2010, the study affirms that there exists the best liability structure which can keep a highest income and least risk. The results will provide some theoretical references for business operators to make financial decision.

Keywords—Debt Operating; Financial Leverage; Risk Management

I. INTRODUCTION

As a management method, debt operating is commonly used in modern business, it has dual characters which can bring along both financial lever income and financial loss to the enterprises because of the financial leverage, and too low debt lever will lose the income of it, but too high will be more risky [7]. From the standpoint of managers, reasonable debt not only makes enterprises obtain more profit than margin earnings before interest and taxes, but also the interest of loan need not to pay the income tax, thus reduce the cost of average capital; From the standpoint of shareholders, as long as the capital profit is higher than the cost of loan, the more debt, the more beneficial to shareholders. But from the perspective of creditors, if the asset-liability ratio is too high, the financial risk will increase greatly, the debt security will decline greatly, so that the creditors will be at a disadvantage [9].

Thus, if there is no debt or little debt, or the enterprises’ debt operating is poor, it is difficult to obtain financial leverage effect, indicating that the enterprise is in stagnant; the operators are lack of confidence in the future. However, if there is too much debt, the huge financial risk cannot guarantee the safety of debt and the confidence of creditors will be affected in financing [2, 10]. Therefore, business decision makers need to balance the relationship between the financial leverage effect and the claims of creditors in order to make the right decisions; this paper jointly analyzes the financial leverage effect and the claims of creditors to provide a method in the financial risk management for business operators.

II. DEGREE OF FINANCIAL LEVERAGE (DFL)

No matter how much operating profit in process of operation, interests on debt and preferred dividends are fixed, then under the premise of ROI is greater than the debt interest rate, the increase in EBIT, income tax for every dollar profit before interest on the debt burden will decline, thus brings additional income to investors, the earnings impacting on profit of investors is known as financial leverage [1].

A leverage ratio summarizing the effect a particular amount of financial leverage has on a company’s earnings per share (EPS). Financial leverage involves using fixed costs to finance the firm, and will include higher expenses before interest and taxes (EBIT). The higher the degree of financial leverage, the more volatile EPS will be, all other things remaining the same [3]. The size of financial leverage financial leverage is usually indicated by DFL, the formula is as follows [1, 7]:

\[
DFL = \frac{\triangle EPS}{\triangle EBIT}
\]

Where: \(\triangle EPS = \triangle EBIT (1-T) / N\)

\[
EPS = \frac{(EBIT-I) (1-T)}{N}
\]

When I, T, N remain unchanged, unite Formula (1), (2) and (3), we can get Formula (4):

\[
DFL = \frac{EBIT}{(EBIT-I)}
\]

Formula (4) can be represented in Fig. 1 as follows.

Fig. 1 The linear relationship between DFL and EBIT

It can be seen from Fig. 1 that:

1) When \(-\infty < EBIT \leq 0\), then \(1 < DFL \leq 2\), it shows that the enterprises are at a loss, but the financial leverage effect is still obvious, the increase in EBIT, earnings per common share will increase higher, that can bring additional revenue to common shareholders, the enterprises are also expected to turn a loss into a profit. On the contrary, if the decrease in EBIT at this time, it will cause earnings per common share to decline more dramatically, the stock price falls sharply, and speeds up the process of enterprise bankruptcy, that reflects the negative effect of financial leverage.

2) When \(2I \leq EBIT < +\infty\), then \(1 < DFL \leq 2\), Financial leverage effect is also obvious, the enterprises are in safe leverage range. When EBIT = 2I, financial leverage effect (DFL = 2) is the most significant, with the increase of EBIT, the effect of financial leverage is not obvious more and more, financial risk gets smaller and smaller, the operating activities become more robust, the claim of creditors will be safe increasingly.

3) When \(0 < EBIT < 2I\), then \(2 < DFL < +\infty\), the enterprises go from a break-point into high-risk range, each of
EBIT increase or decrease by one unit will lead to earnings per share increase or decrease dramatically. In this range, the financial management should focus on increase in EBIT, and business strategy should leave high-risk range to security range as soon as possible.

III. THE INTEREST COVERAGE RATIO (ICR)

Interest coverage ratio is the ratio of EBIT and interest expense in a certain period, which reflects the level of protection on interest expense. From the perspective of profitability, ICR reflects the ability to pay off interests on debt; it helps to reveal the enterprises' ability to pay matured liability in essence. Therefore, ICR is an important index that indicates the enterprises’ solvency abilities the formula is as follows (2).

\[
\text{ICR} = \frac{\text{EBIT}}{I'} \tag{5}
\]

It can be seen that EBIT and ICR is a positive relationship, EBIT is greater, ICR is greater too, which indicates that the higher protection of debt, the financial risk is smaller, the enterprises with high and stable ICR usually are easy to get financing; but for business operators, the high ICR is not a good thing, that suggests the enterprises do not use the financial leverage flexibly, and do not have access to obtain financial leverage benefits [7].

In calculation and application of ICR, we should be aware of two aspects as follows: First, “I” refers to interest costs that include not only interest expenses, but also capitalized interest; second, the high ICR does not mean that enterprises have enough cash to repay matured debt, it merely indicates the level of protection on debt, because accounting profit is determined on accrual accounting basis, the high accounting profit does not mean that enterprises have a strong ability to repay matured debt.

IV. THE LINEAR RELATIONSHIP BETWEEN DFL AND ICR

In summary, we can see that DFL and ICR shows a reverse of change, DFL is increasing, the ICR is decreasing, DFL is decreasing, and ICR is increasing. It shows that, if the business operators want to get higher financial leverage profit, the security of creditors’ claim will decline, and gradually go into a credit crisis; if operators want to improve credit limit, they need to increase EBIT to  guarantee the security of creditors' claim falls to the lowest point [8]. How to find out the best debt structure which the debts bring the biggest income and the minimum financial risk? Formula (5) can be deformed:

\[
\text{EBIT} = \text{ICR} \times I' \tag{6}
\]

Unite Formula (4) and (6), we can get Formula (7):

\[
\frac{1}{\text{DFL}} + \frac{1}{\text{ICR}} \times \frac{I}{I'} = 1 \tag{7}
\]

Where \((I/I')\) is a constant, assumed to be a constant \(K\), then we can get:

\[
\frac{1}{\text{DFL}} + \frac{K}{\text{ICR}} = 1 \tag{8}
\]

Formula (8) can be represented in Fig. 2 as follows:

It can be seen from Fig. 2 that:

1) When DFL = 1, ICR approach infinity, this time interest expenses equal to zero, the enterprise has no debt, no financial risk; when ICR = K, DFL approach infinity, because of \(\frac{\text{EBIT}}{I'} = \frac{I}{I'}\), and EBIT = 1, the all EBIT of enterprises are used to compensate for all interest expenses, which results in pre-tax profit equal to zero, the financial risk is highest [5].

2) When 1 < DFL < 2, ICR starts to decrease from +∞ to 2K, the financial leverage effect becomes more and more obvious, financial risk begins to increase, and business operations are in safe leverage range, but with decrease in ICR, the security of creditors’ claim will decline.

3) When 2 < DFL < +∞, the financial leverage effect increases significantly, at the same time the financial risk increases, and business operations are in high-risk range, while ICR gradually decreases, eventually closes to the minimum K, the security of creditors’ claim falls to the lowest point [8].

4) When DFL = 2, ICR = 2K, from a mathematical point of view, both DFL and ICR achieves the desired maximum [4].

V. EMPIRICAL EVIDENCE FROM CHINESE INDUSTRIAL ENTERPRISES

In order to test correctness of the conclusions, we select 10 representative samples of Chinese industrial companies; the financial data are all from annual reports in 2010.

<table>
<thead>
<tr>
<th>Company</th>
<th>DFL</th>
<th>ICR</th>
<th>Risk Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.005694</td>
<td>176.6235</td>
<td>No Risk but too Conservative</td>
</tr>
<tr>
<td>2</td>
<td>1.070866</td>
<td>15.11114</td>
<td>Lower Risk and Conservative</td>
</tr>
<tr>
<td>3</td>
<td>1.314186</td>
<td>4.182828</td>
<td>Security</td>
</tr>
<tr>
<td>4</td>
<td>1.880223</td>
<td>2.136076</td>
<td>Security</td>
</tr>
<tr>
<td>5</td>
<td>2.000003</td>
<td>1.999997</td>
<td>Optimal Security</td>
</tr>
<tr>
<td>6</td>
<td>2.445929</td>
<td>1.691597</td>
<td>Security</td>
</tr>
<tr>
<td>7</td>
<td>4.057603</td>
<td>1.327054</td>
<td>Security</td>
</tr>
<tr>
<td>8</td>
<td>12.505246</td>
<td>1.086917</td>
<td>High Risk</td>
</tr>
<tr>
<td>9</td>
<td>12.505246</td>
<td>1.086917</td>
<td>High Risk</td>
</tr>
<tr>
<td>10</td>
<td>220.362497</td>
<td>1.004559</td>
<td>Highest Risk</td>
</tr>
</tbody>
</table>

Note: Assuming constant \(K\) is equal to 1.
Of the companies listed in Table I, with increasing of DFL, ICR is decreasing and financing risk highlights. We can see that the financing risk of Company 10 is highest and the Company 1 is lowest, only the Company 5 is in the ideal state of equilibrium.

VI. CONCLUSIONS

In this study we proposed a new model for the prevention of financial risk, it has proved to be feasible in practice, and gives us the enlightenment as follows:

1) In debt financing, managers should consider financial leverage effect and security of creditors’ claim, in order to secure a good credit rating.

2) Enterprises’ operating activities should be carried out in a safe range (1 < DFL ≤ 2, ICR ≥ 2K). In this interval, operators can easily access to obtain safe financial leverage, and the claim of creditors has a greater degree of protection.

3) Enterprises’ operating activities should try to avoid high-risk range (DFL > 2, K < ICR < 2K). In this interval, the enterprises are in the edge of loss and profit, with financial risk increasing, the claim of creditors continues to decline, enterprises face a serious credit crisis, the strategic decision-making in this time will be related the survival and development of enterprises in the future [6].

4) Whether an enterprise is in a profitable or loss state, managers should not abandon efforts to increase EBIT. Especially in the loss state, the increase in EBIT will help enterprise to turn a loss into a profit; on the contrary, the decrease in EBIT will enlarge the risk of enterprise bankruptcy [10].

REFERENCES