Analyzing and evaluating the capital structure of coca cola

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Corporate finance is to maximize company value and managing financial risk, in all firms, managers try to achieve a return greater or the same as required by the firm’s owners, firm can be financed either by equity or by debt, by debt, lenders require a return to compensate their opportunity costs which makes their capital available.

It is convenient for corporation to fund internally as no issuing cost and other cost occur; however, companies need to borrow in order to increase companies’ assets value. The mix of debt and equity are usually available . But is there an optimal level of borrowing? And does borrowing affect value of company? To understand it, we first need to understand cost of equity and cost of debt: Cost of equity is the minimum risk of return that shareholders expect to receive for bearing risk. It is composed of risk free rate and the equity risk premium. The risk -free rate is usually above 2 or 3 percent of the expected rate of inflation, for example, US Treasury bond can be viewed as a signal of risk free rate. Cost of debt is interest rate paid to debt investors.

Because cost of debt is cheaper than equity, in a company, if you borrow too little, you may lose cheap finance, but if you borrow too much, your business may go bust. It is difficult for a manager to make a decision for level of borrowing. And survey showed that levels of borrowing in Italy, Japan, Germany and Sweden are generally higher than in the USA and UK. With a mix of debt and equity, we need to introduce weighted average cost of capital, WACC, defined as minimum rate of return required by both shareholders and lenders.

Now let us take coca cola Company as an example to specify if there is an optimal weighted average cost of capital and the factors that may have an influence on it.

Coca Cola Company is the world's largest beverage company as is viewed as the world's largest most valuable brand. In 1886, in New York harbor , John pemberton, at one afternoon, stirred up a fragrant, caramel-colored liquid combined with carbonated water which agreed by customers , and this is coca cola , named by Pemberton's bookkeeper, Frank Robinson and written in a script until today. Unfortunately, pemberton died in 1888. Between years 1888 to 1891, businessman Asa Griggs Candler brought real version to this brand . Today, Customers in the world consume this company's beverage at a rate of nearly 1. 6 million servings a day. Coca cola aims to refresh the world, inspire the world and create value as well as make a difference in the world.

Coca cola's financial year is between January 1st to December 31, and their financial statements are in accordance with the international financial reporting standard issued by the international accounting standards board. Information of the statements included in this annual report comes from Canadean Ltd Research Reports.

The annual report in this company contains forward-looking statements that involve risk and uncertainties, because they reflect our current expectations and assumptions as to future event and circumstances may not prove to be accurate . To calculate capital structure of this famous company, we collected relevant date from its annual report in year 2006, 2007 and 2008.

During the three years, coca cola company net sales revenue as¿¡5616 million in 2006, ¿¡6462 in 2007 and ¿¡6970 in 2008 and net profit of ¿¡380 in 2006, ¿¡472 in 2007 and¿¡ 425 in 2008. Return on invested capital for the three years are 10. 4% in 2006, 12. 2% in 2007 and 11. 0% in 2008 while EBIT are ¿¡576 million in 2006, ¿¡703million in 2007and¿¡660 million in 2008. Volume in million unit cases are 1788 in year 2006, 2019 in year 2007 and 2113 in year 2008.

Share price of its stock in 2006, 2007 and 2008 are ¼„ 48. 25, ¼„ 61. 37 and ¼„ 45. 27 respectively, dividend for the three years are 0. 29, 0. 34 and 0. 39 per share and the company assume dividend grows at a constant rate of 12% annually(cost of equity in this model assume dividend grows at a constant rate , and we conclude a average date for calculation)Now using cost of equity formula,

Ke= D/P+g

Cost of equity for 2008: 0. 39/ 45. 27+01. 2= 0. 128615

Cost of equity for 2007: 0. 34/61. 37+0. 12= 0. 1255

Cost of equity for 2006: 0. 29/48. 25+0. 12= 0. 126

Year 2006

Year 2007

Year 2008

Cost of equity

0. 126

0. 1255

0. 128615

From the above figure, cost of equity decreased slightly from 2006 to 2007, and then increased again in 2008, that means required return of those shareholders in 2007 reached lowest and in 2008 the highest in the company.

We found that Cost of debt in the market for the past three years is 4. 68% in 2008, 4. 84% in 2007 and 3. 72% in 2006 respectively

Year 2006

Year 2007

Year 2008

Cost of debt

4. 68%

4. 84%

3. 72%

Cost of debt is increased from 2006 as 4. 68% to 2007 as 4. 84% but decreased to the lowest in 2008 as only 3. 72%

Equity figures for three years from the annual report of the company:

Year 2006

Year 2007

Year 2008

Equity (million)

2630. 3

2956. 8

2840. 7

Debt figures funded in the company of the three years in the company:

2, 090. 0 1, 701. 7 1, 599. 2(million)

Year 2006

Year 2007

Year 2008

Debt (million)

1599. 2

1701. 7

2090. 0

D/D+E for the three years:

2008year: 2090. 0/2090. 0+2840. 7= 0. 4239

2007year: 1701. 7/1701. 7+2956. 8= 0. 3653

2006year: 1599. 2/1599. 2+2630. 3= 0. 3817

Debt proportion of the three years:

Year 2006

Year 2007

Year 2008

Debt proportion

38. 17%

36. 53%

42. 39%

E/D+E for the three years:

2008year: 2840. 7/2840. 7+2090. 0= 0. 5761

2007year: 2956. 8/1701. 7+2956. 8= 0. 6347

2006year: 2630. 3/1599. 2+2630. 3= 0. 6219

Equity proportion of the three years:

Year 2006

Year 2007

Year 2008

Equity proportion

62. 19%

63. 47%

57. 61%

Gearing ration for the three years is as follows: Debt/Equity

2008 year: 2090. 0/2840. 7= 0. 7357

2007 year: 1701. 7/2956. 8= 0. 5755

2006 year: 1599. 2/2630. 3= 0. 6080

Year 2006

Year 2007

Year 2008

Gearing ratio

0. 6080

0. 5755

0. 7357

Gearing is the mixture of debt finance relative to equity finance that a company uses to finance its business operations, from the gearing ratio calculated above, we know that company has decreased debt finance relative to equity in from 2006 to 2007 but has again increased debt finance in 2008, gearing ration in 2007 is 0. 5755 and 0. 7357 in 2008, cost of debt(the interest rate paid to debt holders) is increased from 3. 72% in year 2006 to 4. 84% in year 2007 and decreased again to 4. 68% in year 2008, the trend of cost of debt can explain changes in gearing ratio: because cost of debt is increased in year 2007 which means debt is more expensive in year 2007, so the company chooses to finance its business by borrowing less debt and more equity in order to minimize its weighted average cost of capital. When it comes to year 2008, Cola Company borrows more debt and less equity, which is quiet rational because debt is cheaper than previous year.

Now we can calculate WACC using the formula:

WACC= Ke* E/ (D+E) +Kd*D/ (D+E)

In 2008:

WACC= 0. 128615*0. 5761+4. 68%*0. 4239= 9. 39%

In 2007

WACC= 0. 1255*0. 6347+4. 84%*0. 3653= 9. 74%

In 2006

WACC= 0. 126*0. 6219+3. 72%*0. 3817= 9. 26%

Year 2006

Year 2007

Year 2008

WACC

9. 26%

9. 74%

9. 39%

From the data collected from annual report of Coca Cola, we found both equity and debt from year 2006 to year 2008 has increased, equity increased from 2630. 3million to 2840. 7 million, debt increased from 1599. 2million to 2090. 0 million. WACC, the weighted average cost of capital, reached the highest in year 2007 as 9. 74% but fall down again in 2008 as 9. 39% and ultimately there is optimal weighted average cost of capital, as refer to year 2006 as 9. 26%

From the calculation above, from year 2006 to year 2007, debt funding is decreased while WACC is increased . From year 2007 to 2008, debt funding against equity is increasing, and WACC is decreased. This is rational according to traditional view of capital structure as cost of debt is cheaper than equity.

Traditional view ignores taxes and stress that, at first, as borrowing increase, because loan is less risky than equity, thus loan is cheaper than equity, so when the level of borrowing is increasing, WACC is decreasing and vice visa. However, as borrowing increase until a certain point, that financial risk (interest rate changes cause after-tax profit reduction and its ability to pay dividend) and bankruptcy risk (means the company might be unable to meet its debt obligations) for all investors increases, so WACC will increase. Thus, there is a minimum WACC capital structure. And thus value of the company is affected by WACC; lower WACC generates higher value of the company.

Let us compare data of 2006 and 2008, WACC for 2008 is greater than year 2006, but debt funding in year 2008 is greater than year 2006. There might some reasons for it, the most important, and as mentioned above in the traditional view of capital structure, because of the increased financial risk and bankruptcy risk. That is to say, the level of borrowing has exceeded the optimal level, after optimal level, WACC will decrease with more borrowings.

Cost of equity is also increased with more borrowing because of financial risk.

Until now, although Coca Cola Company seems perfect in accordance with

traditional view, it is worthwhile of introducing Modigliani and Miller 1958 and 1963 models.

Modigliani and miller 1958 argues that in the absence of corporation taxes, perfect market exists, there are no risks or costs to bankruptcy, so that debt is risk free, whilst equity is risky because of financial risk .

When there are debts in capital structure, equity holders wish to receive a premium compared to an un-geared company in order to compensate financial risk. Since there is no bankruptcy risk, so cost of debt remains constant. Cost of debt in Coca Cola Company is changing in the three years hence is not inconsistent with this model.

In Modigliani and miller 1958, WACC remains constant regardless of how much debt in capital structure because increased cheaper debt is offset by increased required return demanded by shareholders. And cost of debt remains constant because it is risk free. So there is no optimal capital structure, no optimal mix of debt and equity, and therefore the level of borrowing does not affect the company's value and WACC. From our calculation of coca cola Company, WACC is not constant over the years with different gearing ratio, so this company's capital structure is not in accordance with Modigliani and Miller 1958.

In conclusion in MM 1959, the market value of a firm has nothing to do with its capital structure if taxation is not included, so VL= VU.

Modigliani and Miller 1963, however, introduced the taxation into the model; it suggests that a company can have tax relief when making payments to debt holders as interest payments are deductible for corporation tax. Hence the company can gain a benefit through borrowing. If borrowing is increased, WACC will be decreased, and 100% debt will the optimal capital structure because the more debt borrowed , the more tax shield company can get, so value of a levered firm is greater than an un-levered firm.

Tax shield in this company equals to debt multiplied corporation tax, in coca cola Company, I find from annual report that corporation tax for 2008 is about 31% and 22% in 2006, 21% in 2007 respectively.

Tax shield in the three years calculated as Btc, B represents debt and tc represents corporation tax. Value of a levered firm VL is greater than the value of an unleveled firm VU, So VL= VU+Btc

Year 2006

Year 2007

Year 2008

Tax shield(million)

1599. 2*0. 22= 351. 824

1701. 7*0. 21= 357. 357

2090. 0*0. 31= 647. 90

Tax shield from 2006 to 2008 is increased from 351. 824 million to 647. 90 million and thus value of firm is increasing through the whole three years.

According to MM1963, we know that 100% debt would be the optimal capital structure; however, this might not be true in reality, why? Becasue of risks: high gearing have implications: first, with high gearing it means the company might be overextended, companies might be view as vulnerable and their stock rating and credit rating will suffer, so it is more difficult to

borrow. Second, shareholders may require higher return due to higher gearing, and this diminishes the benefit gained through borrowing. Third, because of the financial risk , during economic downturn or when interest rates rises, companies have to pay higher interests to lender which might lead company to liquidation. In reality, however, Companies with more stable cash flows can afford higher gearing compared with other companies.

From both of traditional view and MM 1958 and MM1963, it should be noticed that cost of equity is increased with more borrowing because of financial risks and business risks, however, cost of debt is increasing in traditional view as the level of borrowing is increasing because of bankruptcy risk, but in Modigliani and Miller's view, they assumes cost of debt is risk free and there is no bankruptcy risk, so that it is always constant.

Coca cola company, as we calculated above, the level of borrowing for year 2006, 2007 and 2008 are 1599. 2 million, 1701. 7 million and 2090. 0 million respectively, however, cost of debt for year 2006, 2007 and 2008 are 3. 72%, 4. 84% and 4. 68%, because debt is the most expensive in 2007, so the level of borrowing is the lowest in year 2007(36. 53%), as we can see, when the level of borrowing from 2006 to 2008 is first decreasing and then increasing, the cost of debt is initially increasing and then decreasing .

To summarize, after analyzing capital structure of Coca Cola company , we know that Coca Cola company's data of capital structure is not always in consistent with these theories, why ? First, the market in reality is not perfect, and also there are some assumptions in these theories which can not be realized in real market as indicated above Although all of these, these

theories is still a useful tool for people to analyses corporation’s capital structure which is crucial for company managers to make a correct decision