3.1.1 Understanding the Power of Leverage Exercise and Answer

Unit: Unit 1 – Treasury Strategy

Module: Module 3 – Financial strategy

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Summary: An exercise to show the influence of leverage in financial strategy and how leverage can change the return on equity in a firm

Keywords: leverage, debt, capital structure, tax, return on equity, weighted average cost of capital, debt capacity, enterprise value

Question

The purpose of this exercise is to show the power of leverage and one of the fundamental reasons to include debt in the capital structure. Nb. in this exercise we will deliberately ignore tax – tax is important, but here we want to concentrate purely on leverage.

	Firm A	**Firm B**	**Firm C**
Funding profile	Low debt	Mid debt	High debt
Market value of Debt (MV_d)	Nil	40	90
Market value of Equity (MV_e)	100	60	10
Enterprise value = $MV_d + MV_e$	100	100	100
Return on enterprise value	20%	20%	20%
Interest rate	5.0%	5.0%	6.0%

Required:

a. For the three firms A B and C, calculate the return on equity, ignoring tax.
b. What assumptions have you made?
c. Comment on the different returns to equity. How are these consistent with Modigliani & Miller's assertion that in the absence of tax, the weighted average cost of capital of a firm will remain constant?
d. Comment *briefly* on how well each firm appears to be using its debt capacity, i.e. *qualitatively* how much debt is each using, compared to how much debt it could take on? How typical is each example? Suggest some sectors to which each firm might belong.

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Answer

a. Return on equity calculations for each firm:

	Firm A	**Firm B**	**Firm C**
	Low debt	Mid debt	High debt
Market value of Debt (MV_d)	Nil	40	90
Market value of Equity (MV_e)	100	60	10
Enterprise value = $MV_d + MV_e$	100	100	100
Return on enterprise value	20%	20%	20%
Interest rate	5.0%	5.0%	6.0%
Earnings before interest	20	20	20
Interest	Nil	(2)	(5.4)
Earnings after interest	20	18	14.6
Return on equity $= \frac{\text{Earnings after interest}}{\text{MVe}}$	$\frac{20}{100} = 20\%$	$\frac{18}{60} = 30\%$	$\frac{14.6}{10} = 146\%$

b. Assumptions. We have assumed that 'earnings' are the same as cash – which is usually not the case.

c. The differences in return on equity are substantial and it is easy to see why equity investors would be happy to see their firm take advantage of higher leverage. For just a moderate increase in leverage, their returns are 'geared' up, in this example by 50% from Firm A to Firm B, even more so when we get to Firm C. This is possible because the return on enterprise value is higher than the interest cost. Accordingly, this decision is probably the most important decision of the many that comprise financial strategy. Note that in this example additional returns accrue to equity holders even in the absence of tax. In such a case Modigliani and Miller say that the *weighted average* cost of capital should be constant, but this example demonstrates how the share of the rewards can be switched among investor classes even in the absence of tax.

d. On the face of it, Firm A is using too little of its debt capacity – most firms borrow as well as use equity if only to smooth seasonality in their funding requirements. However perhaps the quality of its profits are such that they are very volatile and cannot be relied on to service debt, that is to pay interest and repay capital over time. In today's (mid 2010s) economic climate firms have deleveraged, and many are using far less than their theoretical optimum debt – across all sectors. And some (mainly family-owned) companies do not borrow on principle.

Firm B is moderately levered and this is fairly typical of many large companies in ‘normal’ times.

The highly leveraged Firm C is probably less typical and this type of structure is fairly rare. However, leverage approaching this is fairly common in some sectors, especially where the return on assets is low but predictable. Firms such as utilities can only achieve equity returns competitive with levels elsewhere in the market by high leverage. This is envisaged under CAPM; equity investors require a premium over the risk free rate and so if the business model does not produce these returns by itself, then leverage is a solution to create such returns (at increased risk). Businesses which fit this model include utilities and banking.

Another factor might be the availability of capital. There may be more equity than debt investors interested in the type of capital structure and the businesses in Firms A and B but less so in Firm C, in which case debt must be used to make up the shortfall. Utilities, property companies, private equity financed firms and banking, are typical sectors that have very heavy debt raising programmes.

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