



# Corporate Finance and Risk Management STRATEGIC LEVEL DEC 2022

Long – Term Financing

## Capital Structure

We will ,  
How entity should manage their different finance sources in  
order to maximize their profit while minimizing the finance  
risk



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### The capital structure decision

- We have previously looked at the sources and costs of debt and equity finance.
- We now need to look at what **proportion of debt and equity** an entity should use.
- Debt finance can create valuable **tax savings** which can reduce the cost of capital and increase shareholder value.
- However, too much debt increases **financial risk**.

## Capital structure

**Capital structure** refers to the way in which an organisation is financed, by a combination of long-term capital (ordinary shares and reserves, preferred shares, bonds, bank loans, convertible bonds) and short-term liabilities, such as a bank overdraft and trade payables.

*The mix of finance can be measured by **gearing** ratios.*

**The assets of a business must be financed somehow. When a business is growing, the additional assets must be financed by additional capital. As part of this decision, it is necessary to consider the duration of the financing and remember the concept covered earlier that long-term assets should be financed by long-term funds.**

## The advantages of using debt finance

- (a) Debt is a **cheaper form of finance** than shares because, unlike preferred shares, debt interest is tax-deductible in most tax regimes.
- (b) Debt should be **more attractive** to investors because it will be **secured** against the assets of the company.
- (c) Debt holders rank above shareholders in the event of a liquidation.
- (d) Issue costs should be lower for debt than for shares.
- (e) There is no immediate change in the existing structure of control, although this will change over time as conversion rights are exercised.
- (f) There is no immediate dilution in earnings and dividends per share.
- (g) Lenders do not participate in high profits compared with shares.
- (h) Debt acts as a discipline on management, as careful management of working capital and cash flow is needed.

## Disadvantages of debt

- (a) **Interest** has to be paid on debt no matter what the company's profits in a year are. In particular, the company may find itself locked into long-term debt at unfavorable rates of interest. The company is not legally obliged to pay dividends.
- (b) If the business struggles to pay the interest on debt, **direct financial distress costs** may be incurred in the form of higher debt payments and costs of managing the liquidation process.
- (c) **Indirect financial distress costs** can include a loss of sales, higher costs from suppliers or sale of inventory at below market value.
- (d) **Agency costs** occur when managers may be reluctant to invest if gearing levels are already high.
- (e) Money has to be made available for **redemption** or **repayment** of debt.
- (f) Heavy borrowing **increases the financial risks** for ordinary shareholders who may demand a **higher rate of return** because an increased interest burden increases the risks that dividends will not be paid.
- (g) There might be restrictions on a company's power to borrow. The **company's constitution** may limit borrowing. These borrowing limits cannot be altered except with the approval of the shareholders at a general meeting of the company. **Restrictive covenants attached to existing debt** may **limit borrowing** by specifying a maximum gearing level. These limits can only be overcome by redeeming the debt. Restrictive covenants also require the borrower to satisfy certain criteria such as minimum interest coverage.
- (h) Debt is not necessarily always **available** to all companies. Small companies traditionally struggle to raise long-term debt finance, and during a recession debt finance is less readily available than in a period of economic growth.

## debt financing will be more appropriate when:

- The company is in a **healthy competitive position**
- The **debt : equity ratio** is low
- **Cash flows** and **earnings** are stable
- **Share prices** are **low**, which means shareholders require a higher return.
- The **bulk of the company's assets** are **tangible**
- **Profit margins** are **reasonable**
- The **liquidity** and **cash flow position** is **strong**

**Life cycle** issues are therefore important. Young, growing companies tend to have **unpredictable and unstable cash flows**, so debt finance is less appropriate than for mature companies.

## Gearing (leverage)

The financial risk of a company's capital structure can be measured by a **gearing ratio**, a **debt ratio** or **debt:equity ratio** and by the **interest cover**. A gearing ratio should not be given without stating how it has been defined.

**Note.** You need to be able to explain and calculate the level of financial gearing using alternative measures. The question may specify how gearing should be calculated, eg debt to total value of entity using market values.

**Financial gearing** measures the relationship between shareholders' capital plus reserves, and either prior charge capital or borrowings or both. Commonly used measures of financial gearing are based on the statement of financial position values of the fixed interest and equity capital. They include:

$$\frac{\text{Prior charge capital /debt}}{\text{Equity capital (including reserves)}} \quad \text{or} \quad \frac{\text{Prior charge capital}}{\text{Total capital employed}^*}$$

\*Either including or excluding minority interests, deferred tax and deferred income.

*With the first definition above, a company is low geared if the gearing ratio is less than 100%, highly geared if the ratio is over 100% and neutrally geared if it is exactly 100%.*

*With the second definition, a company is neutrally geared if the ratio is 50%, low geared below that, and highly geared above that.*

## Gearing ratios based on market values

An alternative method of calculating a gearing ratio is one based on **market values**:

$$\frac{\text{Market value of debt (including preference shares)}}{\text{Market value of equity + Market value of debt}}$$

The advantage of this method is that potential investors in a company are able to judge the further debt capacity of the company more clearly by **reference to market values** than they could by looking at statement of financial position values.

## Interest cover

Like gearing, **interest cover** is a measure of financial risk which is designed to show the risks in terms of profit rather than in terms of capital values.

$$\text{Interest cover} = \frac{\text{Profit before interest and tax}}{\text{Interest payable}}$$

As a general guide, an interest cover of **less than three times** is considered low, indicating that profitability is too low given the gearing of the company.

Gearing is an attempt to quantify the **degree of risk** involved in holding equity shares in a company, both in terms of the company's ability to remain in business and in terms of expected ordinary dividends from the company.

The more geared the company is, the **greater the risk** that *little (if anything) will be available to distribute* by way of dividend to the ordinary shareholders.

This means that there will be greater **volatility** of amounts available for ordinary shareholders, and presumably therefore greater volatility in dividends paid to those shareholders, where a company is highly geared. That is the risk.

You may do extremely well or extremely badly without a particularly large movement in the profit from operations of the company.

Gearing ultimately measures the company's ability to **remain in business**.

*A highly geared company has a large amount of interest to pay annually. If those borrowings are 'secured' in any way, then the holders of the debt are perfectly entitled to force the company to realize assets to pay their interest if funds are not available from other sources. Clearly, the more highly geared a company, the more likely this is to occur when and if profits fall.*

## Theories of capital structure

➤ **traditional theory**

➤ **net operating income approach**  
(Modigliani and Miller).

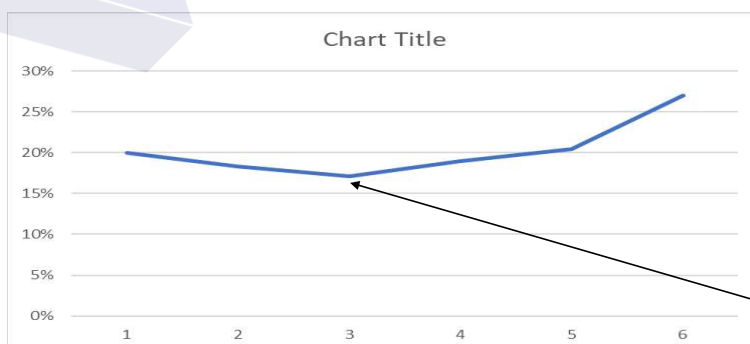
➤ **The traditional view of weighted average cost of capital (WACC)**

The **traditional view** is as follows.

- ✓ As the **level of gearing increases**, the **cost of debt** remains **unchanged** up to a certain level of gearing. Beyond this level, the cost of debt will increase as interest cover falls, the amount of assets available for security falls and the risk of bankruptcy increases.
- ✓ The **cost of equity** rises as the level of **gearing increases** and **financial risk increases**.
- ✓ The **weighted average cost of capital** does **not remain constant**, but rather falls initially as the proportion of debt capital increases, and then begins to increase as the rising cost of equity (and possibly of debt) becomes more significant.
- ✓ The **optimum level of gearing** is where the **company's weighted average cost of capital is minimized**.

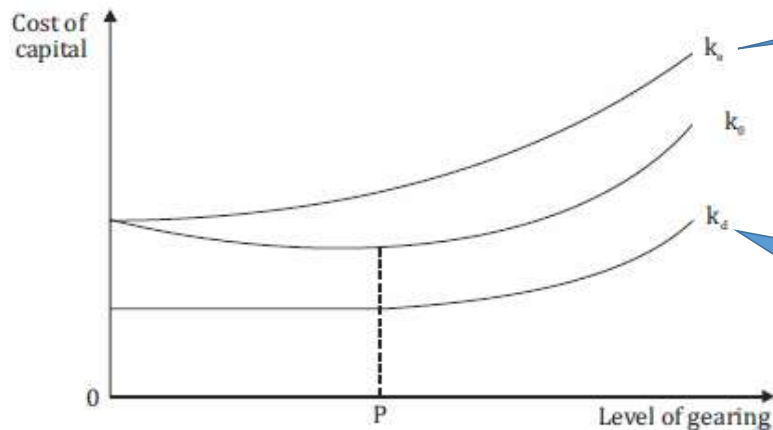
Equity	100	100	100	100	100	100
Debt	0	20	40	60	80	100
Ke	20%	20%	20%	22%	24%	36%
Kd	0	10%	10%	14%	16%	18%
WACC	20%	18%	17%	19%	20%	27%
When Gearing increasing						
1 lender will expect more return, therefore kd will increase						
2 owner/ SH also expect more return, therefore ke will increase						
Finally:						
WACC will start to decrease and thereafter it will increase						

✓ cost of debt will increase as interest cover falls, the amount of assets available for security falls and the risk of bankruptcy increases.



Best capital structure when lowering the WACC

## Traditional view of weighted average cost of capital (WACC)



When Gearing increases  $k_e$  will increase due to increasing business risk

When Gearing increases  $k_d$  remain unchanged and starting increase due to additional finance risk

Where:  $k_e$  is the cost of equity in the geared company  
 $k_d$  is the (after tax) cost of debt  
 $k_0$  is the weighted average cost of capital

The traditional view is that the weighted average cost of capital, when plotted against the level of gearing, is saucer shaped. The optimum capital structure is where the weighted average cost of capital is lowest, at point P.

## ➤ The net operating income (Modigliani-Miller (MM)) view of WACC

The net operating income approach takes a different view of the effect of gearing on WACC. In their 1958 theory, Modigliani and Miller (MM) proposed that the total market value of a company, in the absence of tax, will be determined only by two factors:

- The **total earnings** of the company
- The **level of operating (business) risk** attached to those earnings (WACC)

The total market value would be computed by discounting the total earnings at a rate that is appropriate to the level of operating risk. This rate would represent the WACC of the company.

Thus Modigliani and Miller concluded that **the capital structure of a company would have no effect on its overall value or WACC.** (When gearing increasing WACC won't increase)

## Assumptions of net operating income approach

Modigliani and Miller made various assumptions in arriving at this conclusion, including:

- (a) A **perfect capital market** exists, in which investors have the same information, on which they act rationally, to arrive at the same expectations about future earnings and risks.
- (b) There are no **tax or transaction costs**.
- (c) **Debt is risk-free** and freely available at the same cost to investors and companies alike.

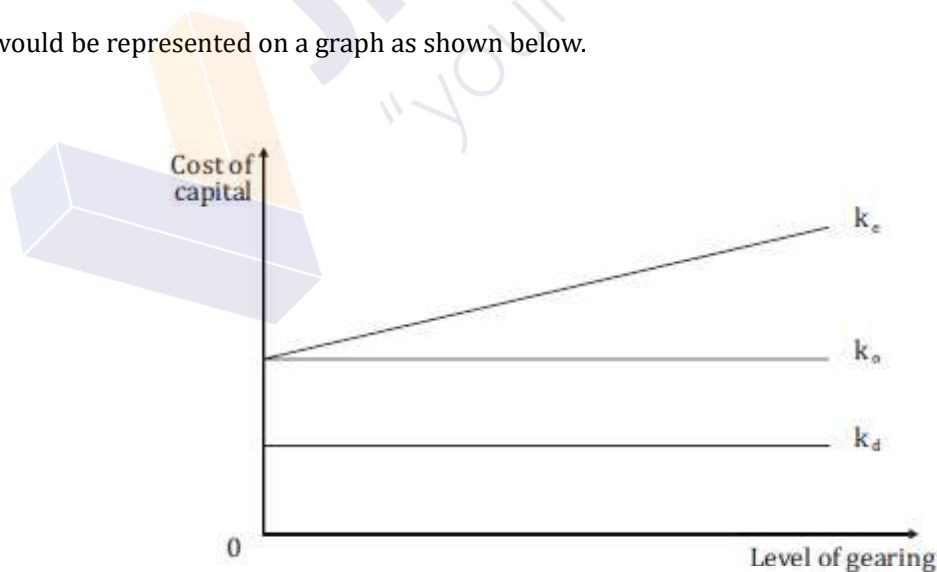
Modigliani and Miller justified their approach by the use of **arbitrage**.

**Arbitrage** is the simultaneous purchase and sale of a security in different markets, with the aim of making a risk-free profit through the exploitation of any price difference between the markets.

If Modigliani and Miller's theory holds, it implies:

- (a) The **cost of debt remains unchanged** as the level of gearing increases.
- (b) The **cost of equity rises** in such a way as to keep the **weighted average cost of capital constant**.

This would be represented on a graph as shown below.



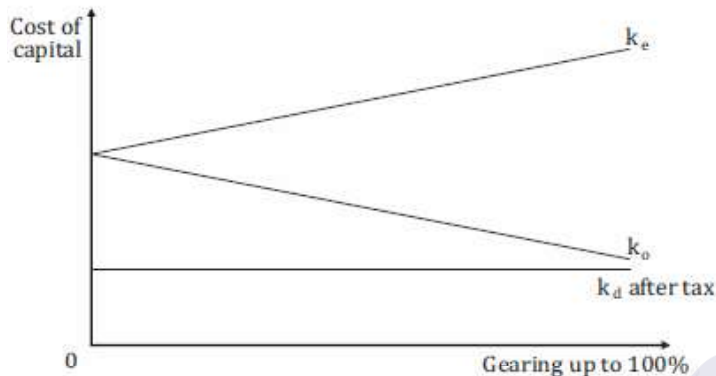


## Modigliani-Miller theory adjusted for taxation

Having argued that debt has no benefit in the absence of taxation, MM then went on to demonstrate that debt can be beneficial where tax relief applies.

Allowing for **taxation reduces the cost of debt capital** by multiplying it by a factor  $(1 - t)$ , where  $t$  is the rate of tax (assuming the debt to be irredeemable).

MM modified their theory to admit that tax relief on interest payments does makes debt capital cheaper to a company, and therefore **reduces the weighted average cost of capital** where a company has debt in its capital structure. They claimed that the weighted average cost of capital will continue to fall, up to gearing of 100%.



### FORMULA TO LEARN

MM developed the following formula as part of their 'with-taxation' theory:

$$V_g = V_u + TB$$

Where:  $V_g$  = value of debt plus equity in geared company

$V_u$  = value of equity in an equivalent ungeared company

$TB$  = tax shield on debt ( $T$  is the corporate tax rate and  $B$  is the market value of the geared company's debt)

This formula shows that the greater the value of debt, the greater the value of the company, and so supports the idea that a company should be geared as highly as possible to maximise its value.

#### FORMULA TO LEARN

A further formula arising from MM's theory is:

$$k_{eg} = k_{eu} + (k_{eu} - k_d) \frac{V_d}{V_e} (1 - T)$$

Where:  $k_{eg}$  is the cost of equity in a geared company  
 $k_{eu}$  is the cost of equity in an ungeared company  
 $V_d, V_e$  are the market values of debt and equity respectively  
 $k_d$  is the cost of debt pre-tax  
 $T$  is the corporate tax rate

This formula shows that the cost of equity will increase when the relative value of debt to equity increases.

#### FORMULA TO LEARN

MM also came up with an adjusted cost of capital formula as follows:

$$k_{adj} = k_{eu}(1 - tL)$$

Where:  $k_{adj}$  is the weighted average cost of capital in a geared company  
 $k_{eu}$  is the cost of equity in an ungeared company  
 $t$  is the corporate tax rate  
 $L$  is the gearing ratio measured by debt/(debt + equity)

This formula shows that WACC is reduced when gearing increases, i.e. when more debt is taken on.

### Weaknesses in MM's theory

MM's theory has been criticized as follows.

(a) MM's theory assumes that **capital markets are perfect**. For example, a company will always be able to raise finance to fund worthwhile projects. This ignores the danger that higher gearing can lead to **financial distress costs** and **agency problems**.

(b) **Transaction costs** will restrict the arbitrage process.

(c) Investors are **assumed to act rationally**, which may not be the case in practice.

## Capital structure in the real world

- ✓ In the real world, some of the theoretical assumptions in MM's theory **do not hold**.
- ✓ The most unrealistic are that perfect capital markets exist and that debt is risk free.
- ✓ Almost every borrower would agree that there is **greater risk** at very high levels of gearing and lenders will feel the same.
- ✓ This risk is that the borrower will not be able to service its interest payments and the company may become **insolvent**.

In reality, there are a number of factors that can influence the capital structure.

### ❑ Debt capacity

**Debt capacity** refers to the maximum amount of debt that a company can support or obtain. A company will have a greater capacity to borrow if it has a number of assets that can be offered as security on the debt.

A company can only increase its borrowing if there are lenders willing to **provide finance**. This may not necessarily always be easy, depending on the **financial position** of the company and the state of the **economy**.

### ❑ Debt covenants

Existing debt may have covenants attached, which require certain **targets** to be met by the borrower and therefore **reduce the flexibility** of management.

Existing covenants may **prevent** or limit opportunities for further borrowing. Examples of financial covenants include target interest cover ratios or cash flow/ earnings target levels. Breaching covenants may trigger an early repayment of the debt or other penalties.

### ❑ Increasing debt costs

MM's theory assumes that the cost of debt is unchanged at all levels of gearing. In reality, as a borrower takes on greater levels of debt, and is perceived to be **riskier**, the lender's required rate of return is likely to **increase**.

### ❑ Tax exhaustion

The benefit of tax relief on debt is only available while the borrower is making a taxable profit. If gearing is high enough, there will be a point where the interest payments will reduce taxable profit to zero and any further debt will not benefit from tax relief. This is known as tax exhaustion.



### Direct financial distress costs

The direct financial distress costs faced by a firm are the legal and administrative costs associated with the bankruptcy or reorganisation of the firm. Studies have shown that such costs range from less than 1% to approximately 4–5% of the value of the firm.

### Indirect financial distress costs

There are different types of cost (mostly implicit) that a firm faces when it is in a financially stressful situation (but not bankruptcy). The following are some of those costs:

- A higher cost of capital (either for debt or equity) due to a firm's high risk of default.
- Lost sales due to customers having concerns that a firm with high gearing may cut back on the quality of goods or services, or may be at risk of failure and so will not be able to provide after sales service or to honor product guarantees.
- Managers and employees will try drastic actions to save the firm that might result in some long-term problems; such actions include closing down plants, downsizing, drastic cost cuts and selling off valuable assets; these actions will ultimately dilute the value of the firm.
- Firms might have trouble keeping highly skilled managers and employees, who may not want to be associated with a firm that is at risk of failing due to high debt levels.

A key drawback of Modigliani and Miller theory is that it ignores the existence of financial distress costs. However, when these are taken into account it can be argued that the **gearing-adjusted** value of the firm should be decreased.

**The value of the company in this case will be:**

**Value of the ungeared firm + present value of tax savings due to interest payments – present value of financial distress costs.**

## Agency theory

The agency theory provides a rationale for an optimal structure based on the existence of agency costs associated with the issue of debt and equity.

### Agency costs of debt

Agency costs of debt only arise when there is a **risk of default**. If debt is totally free of default risk, debtholders are not concerned about the income, value or the risk of the firm. However, as **gearing increases**, the **probability of default also increases** and with this comes the likelihood of substantial bankruptcy costs.

If the possibility of default exists, **shareholders can gain at the expense of debt holders**. For instance, after issuing debt, a firm may decide to restructure its assets, selling off those with low business risk and acquiring assets that are more risky and thus have a higher possibility of default but also have higher expected returns.

If things work out well, then the **shareholders** will get most of the benefit but, if not, then much of the loss will fall on the **bondholders**, who will have already agreed to be compensated with a lower interest rate than the risk level of the firm presupposes.

### Agency costs of equity

**Agency costs** also exist in relation to the **new share issues**. The cause of agency costs in this case is the potential conflict between **old shareholders** and **new shareholders**. New shareholders will want to monitor the management of the company to make sure that the original shareholders do not benefit at the expense of new shareholders.

These monitoring mechanisms are expensive and the agency costs associated with the issue of new equity is increased with the amount of new equity issued.

The optimal capital structure of the firm will be formed at the particular level of debt and equity where the benefits of the debt that can be received by the shareholders balance equal the costs of debt imposed by the debt holders.

### Pecking order theory

Pecking order theory is based on the idea that shareholders have less information about the firm than directors do.

Shareholders and other investors will use directors' actions as signals to indicate what directors believe about the firm, given their superior information.

#### Debt or equity?

When deciding how to finance a project, managers will consider such issues as tax relief on debt and risk of default on debt. However, trying to get the timing right is another consideration.

Managers will prefer to **issue equity** when the **share price is high** (even to the point of being overvalued). They will prefer not to issue equity when the share price is considered to be low (or undervalued). In other words, managers will **issue debt** (increase gearing) when the **share price is low** and issue equity when the share price is high.

As a result, investors will use the issue of debt or equity as a **signal** from managers as to the true worth of the company's shares. Managers typically have better information than investors that can be used to value the shares (**information asymmetry**).

### Market signals

As mentioned above, investors may use the issue of debt or equity as a signal as to the likely true worth of the company's shares.

If equity is issued, the market will take this as a signal that shares are overvalued. This may result in investors selling their shares (thus making substantial gains) which will lead to a fall in the share price. If this happens, the cost of equity may rise, which will result in a higher marginal cost of finance. To avoid this possibility, managers may decide to issue debt even if shares are seen as being overvalued.

An issue of debt may be interpreted as an undervaluation of the shares. Investors will want to 'get a bargain' and will thus start to buy the shares, leading to an increase in share price.

### So what is the 'pecking order'?

The preferred 'pecking order' for financing instruments is as follows:

(a) **Retained earnings.** To avoid any unwanted signals, managers will try to finance as much as possible through internal funds.

(b) **Debt.** When internal funds have been exhausted and there are still positive NPV opportunities, managers will use debt to finance any further projects until the company's debt capacity has been reached. **Secured debt** (which is less risky) should be **issued first**, followed by unsecured (risky) debt.

(c) **Equity.** The 'finance of last resort' is the issue of equity.

### Adjusted present value

- ✓ The viability of an investment project will depend partly on how the investment is financed, and how the method of finance affects gearing. The adjusted present value method provides a better means of taking into account the effects of using loan finance than simple NPV analysis does.
- ✓ The net present value method of investment appraisal is to **discount the cash flows** of a project at a **cost of capital**. This cost of capital might be the WACC, but it could also be another cost of capital, perhaps one which allows for the risk characteristics of the individual project.
- ✓ An alternative method of carrying out project appraisal is to use the **adjusted present value (APV) method**.

### When to use the APV method

The APV method is suitable in the following situations.

- (a) If the funding for the project includes a **subsidised loan**
- (b) If the **debt capacity** of the company is increased
- (c) If the company wants to compare a number of **different capital structure options**

## The advantages and disadvantages of the APV method

The main advantages of the APV are as follows.

(a) APV can be used to **evaluate** all the **effects of financing** a product including:

- (i) Tax shield
- (ii) Changing capital structure
- (iii) Any other relevant cost

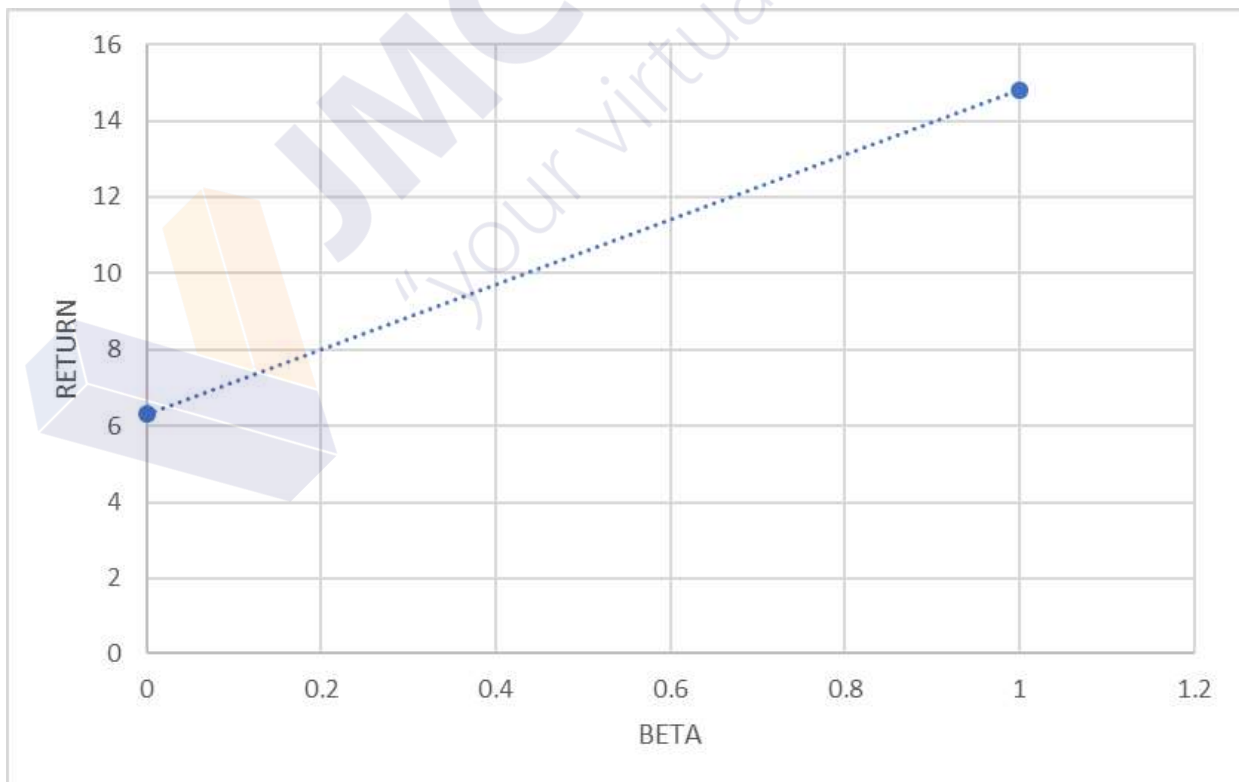
(b) When using APV, you do not have to adjust the WACC using assumptions of perpetual risk-free debt.

The main difficulties with the APV technique are:

(a) **Establishing a suitable cost of equity**, for the initial DCF computation as if the project were all-equity financed, and also establishing the all-equity  $\beta$ .

(b) **Identifying all the costs** associated with the method of financing.

(c) Choosing the correct discount rates used to discount the costs.





## Conclusion

- How to obtain value of a geared company

Value of Geared entity = value of ungeared + (tax shield x mkt value of debt)

- Cost of equity in a geared company =

Cost of equity in a ungeared company + (Cost of equity in a ungeared company – cost of debt) x debt/equity x (1-t)



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