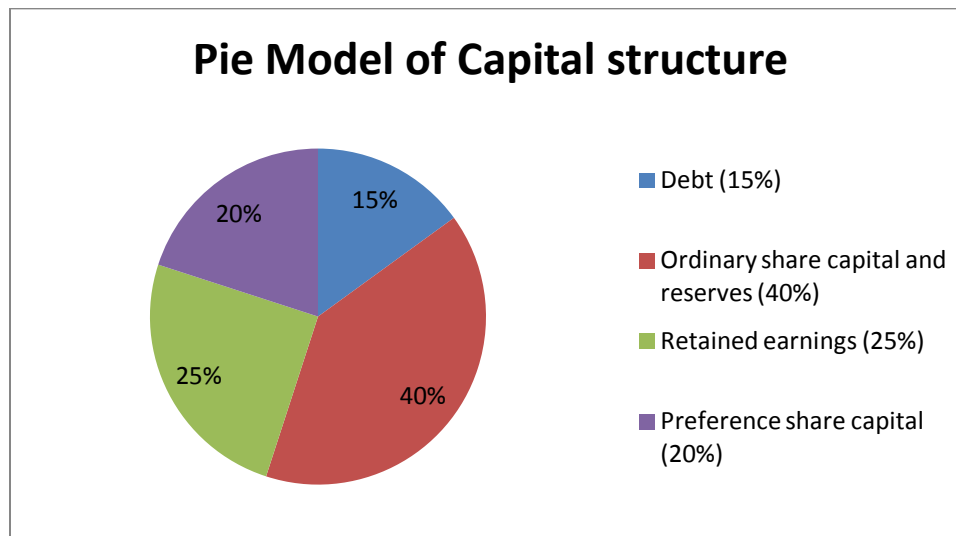


CAPITAL STRUCTURE 1- INTRODUCTION

What do we mean by capital structure?

Capital Structure is the mixture of debt and equity resulting from decisions on financing operations. Different firms may have different capital structures. A typical company may have a capital structure with 15% debt, 65% equity (25% from retained earnings and the rest from ordinary share capital and reserves) and 20% preference share capital. We represent this company's capital structure in the pie model below:



Does capital structure matter? (MM1: No taxes and financial distress)

To Modigliani and Miller (MM), the traditional perception of the impact and desirability of gearing (leverage/ having debt in capital structure) seemed unsupported by a theoretical framework. In particular, there seemed little reason, apart from some form of market imperfection such as information deficiency, why merely altering the capital structure of a firm should be expected to alter its value. After all, neither its earnings stream nor its inherent business risk would alter it would remain essentially the same enterprise, operating under the same managers and in the same industry. MM contended that, in a perfect capital market, the value of a company depended simply on its income stream and the degree of business risk attaching to this, regardless of the way in which its income was split between owners and lenders, i.e. its capital structure. Therefore, any imbalance between the value of a geared company and an otherwise identical ungeared company could only be a temporary aberration and would be quickly unwound by market forces. The mechanism for equalizing the values of companies, identical except for their respective gearing, was the process of 'arbitrage', a feature of all developed financial markets which ensures that assets with the same risk–return characteristics sell at the same prices.

Does capital structure matter? Debt and the interest tax shield (MM2: With corporate taxes)

Debt financing has one important advantage under the corporate income tax system in Kenya. The interest that the company pays is a tax-deductible expense. Dividends and retained earnings are not. Thus the return to bondholders escapes taxation at the corporate level. The illustration

below shows the tax shield in action- firm U has no debt, but firm L has borrowed 1 million shillings at 8%.

	Firm U (Ksh. 000)	Firm L (Ksh. 000)
Earnings before interest and taxes	1,000	1,000
Interest paid to bondholders	0	80
Pretax income	1,000	920
Tax (35%)	350	322
Net income to stockholders	650	598
Interest tax shield (0.35 x interest)	0	28

Tax shields can be valuable assets. Suppose that the debt of L is fixed and permanent. (That is, the company commits to refinance its present debt obligations when they mature and to keep rolling over its debt obligations indefinitely.) It looks forward to a permanent stream of cash flows of Ksh.28 per year. The risk of these flows is likely to be less than the risk of the operating assets of L. The tax shields depend only on the corporate tax rate and on the ability of L to earn enough to cover interest payments. The corporate tax rate has been pretty stable. And the ability of L to earn its interest payments must be reasonably sure; otherwise it could not have borrowed at 8 percent. Therefore we should discount the interest tax shields at a relatively low rate. But what rate? One common assumption is that the risk of the tax shields is the same as that of the interest payments generating them. Thus we discount at 8 percent, the expected rate of return demanded by investors who are holding the firm's debt:

$$PV \text{ of interest shield} = \frac{28}{0.08} = 350$$

How Do Interest Tax Shields Contribute to the Value of Stockholders' Equity?

MM's proposition I amounts to saying that the value of a pie does not depend on how it is sliced. The pie is the firm's assets, and the slices are the debt and equity claims. If we hold the pie constant, then a dollar more of debt means a dollar less of equity value.

But anything the firm can do to reduce the size of the government's slice obviously makes stockholders better off. One thing it can do is borrow money, which reduces its tax bill and, as we have seen above, increases the cash flows to debt and equity investors. The after-tax value of the firm (the sum of its debt and equity values as shown in a normal market value balance sheet) goes up by PV (tax shield).

Value of firm = value if all-equity-financed + PV (tax shield)

$V = V_u + T_c D$ which can also be rewritten as;

$$V_L = V_u + T_c D$$

V_L is the value of a firm levered (that has debt in its capital structure)

V_u the value of a firm unlevered (that has NO debt in its capital structure, i.e. all equity financed,

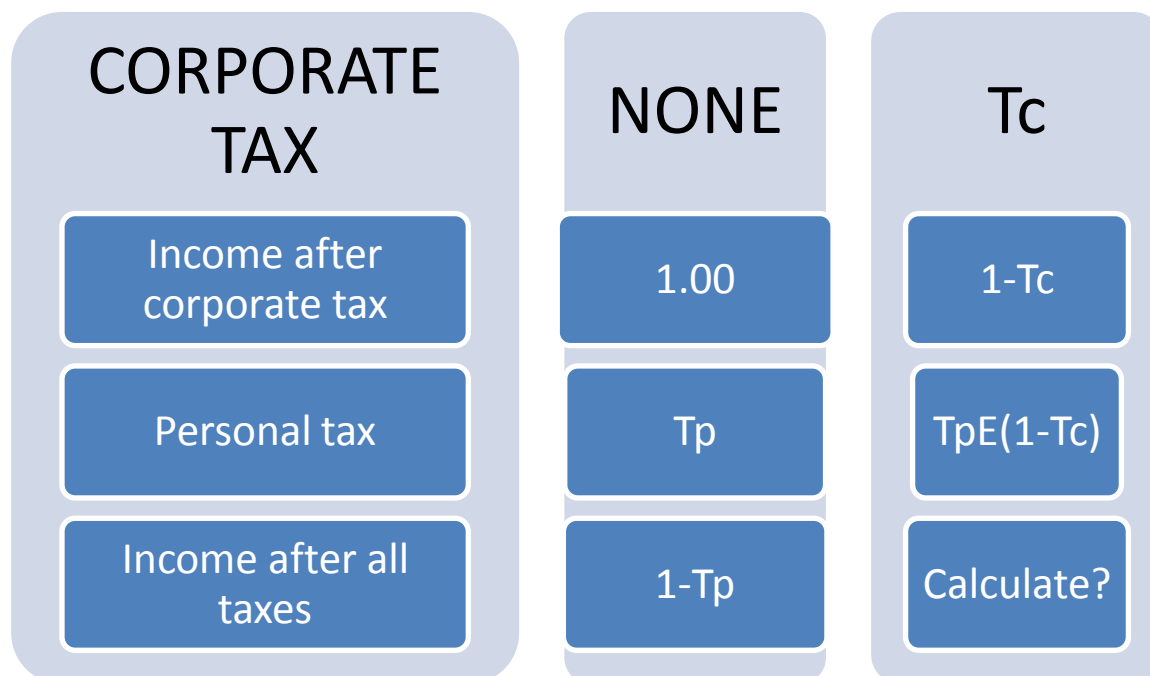
$V_u = V_e$)

Where V is the total value of firm, V_e is the value of an all equity financed firm, T_c is the tax rate, and D is the total debt for the firm. We shall be looking at this issue later on.

Does capital structure matter? Corporate and personal taxes (MM3: with corporate and personal income taxes)

When personal taxes are introduced, the firm's objective is no longer to minimize the corporate tax bill; the firm should try to minimize the present value of all taxes paid on corporate income. "All taxes" include personal taxes paid by bondholders and stockholders.

The figure below illustrates how corporate and personal taxes are affected by leverage. Depending on the firm's capital structure, a shilling of operating income will accrue to investors either as debt interest or equity income (dividends or capital gains). That is, the income can go down either branch of the figure. Assuming there is a ksh.1 of income before corporate tax.



Note: $T_p E$ is the tax rate on equity income (dividends and capital gain). T_p is the tax rate on debt interest. The two rates are equal if equity income comes entirely as dividends. But can be less than if equity income comes as capital gains.

The firm's objective should be to arrange its capital structure so as to maximize after-tax income. You can see from the figure that corporate borrowing is better if $(1 - T_p)$ is more than $(1 - T_p E) \times (1 - T_c)$ (otherwise it is worse. The relative tax advantage of debt over equity is;

$$\text{Relative tax advantage of debt} = \frac{1 - T_p}{(1 - T_p E)(1 - T_c)}$$

When debt and equity income are taxed at the same effective rate, then $T_p E = T_p$ and hence

$$\text{Relative tax advantage of debt} = \frac{1-T_p}{(1-T_p)(1-T_c)} = \frac{1}{(1-T_c)}$$

Does capital structure matter? Debt and financial distress (MM4: with corporate and personal income taxes and financial distress costs)

Financial distress occurs when promises to creditors are broken or honored with difficulty. Sometimes financial distress leads to bankruptcy. Sometimes it only means skating on thin ice. Financial distress is costly. Investors know that levered firms may fall into financial distress, and they worry about it. That worry is reflected in the current market value of the levered firm's securities. Thus, the value of the firm can be broken down into three parts:

Value of firm = value if all-equity-financed + PV (tax shield) - PV (Costs of financial distress, Cfd)

V = V_e + T_cD - Cfd which can also be rewritten as;

$$V_L = v_u + T_c D - Cfd$$

V_L is the value of a firm levered (that has debt in its capital structure)

v_u the value of a firm unlevered (that has NO debt in its capital structure, i.e. all equity financed, v_u=V_e)

The costs of financial distress depend on the probability of distress and the magnitude of costs encountered if distress occurs.