# HOW DOES TAXATION AFFECT CAPITAL STRUCTURE OF FIRMS IN TANZANIA?

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**Abstract:** This paper reviews the theoretical and empirical structure on taxation and capital structure and applies it to the Tanzanian environment. Substantial evidence exists that the taxation policy of a country and the effective tax level prevailing in an economy can have an impact on the amount of debt in a firm's long term financing structure. Much of the development of this conventional wisdom draws from studies of developed economies such as the United States of America and United Kingdom and may not readily extend to a developing country like Tanzania. This study sets to examine extant academic and practitioner research in this area and extract implications for Tanzanian firms. Our analysis allows us to argue that there will be an optimal capital structure for Tanzanian companies at which firm's value is maximised. Moreover, over a cross section of firms the level of debt will rationally vary as a function of firm and industry characteristics.

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## INTRODUCTION

How are Tanzanian firms affected by current tax regulations? This question is of interest not only to managers of Tanzanian firms but also to their shareholders and government policymakers alike. This paper examines the findings of recent empirical and theoretical research on this topic and applies the insights to the Tanzanian environment. Most work on taxation and capital structure relates primarily to developed economies and their systems. However the validity of blindly extending the insights gained from extant work to the emerging markets context is questionable and may lead to misunderstandings or more importantly to misguided managerial objectives relating to financing decisions.

The value of the firm depends on many different factors and a broad categorisation can be made according to different areas of managerial decision market-making activity. The first group is that which relates to investment decision and deals with the assets (or investments) in which a firm has and will invest in the future. A second group, relating to financing decisions, concerns the choice of finance vehicles that are utilised to raise capital for investment. Finally a third group

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pertains to dividend decisions. That is, the frequency and proportion (if any) of earnings disbursements to shareholders.

Since the seminal work of Modigliani and Miller (1958), research has focused on how managerial decision and firm value interact. An analysis of investment viability requires the estimation of future cash flows and cost of capital which, to larger extent, depend on the operational and information efficiency of financial markets. Financing and dividend decisions can not be separated from the influence of financial markets. Moreover, management is required to know and understand how their dividend policy may affect firm market value.

Tanzanian firms, which face a variety of market in efficiencies resulting from low capital liquidity and an inefficient regulatory environment. are particularly exposed to these microstructural frictions. In the case of financing decisions, managers must ask whether using debt, equity or a combination of the two would lead to an increase in firm value. As Titman (2002) argues, '... market conditions, which are determined by preferences of the individuals and institutions that supply capital can have an important effect on how firms raise capital'.

Theoretical analysis suggests that, taxes potentially characterise a company's capital structure[1]. However, a complete characterisation of this corporate decision within the Tanzanian context has yet to be developed. The objective of this paper is to provide a summary of the tax-related theories

of capital structure and how these can be applied within the Tanzanian context.

The paper commences by reviewing the basic theoretical framework of capital structure, assuming the presence of perfectly competitive capital markets and no taxation. The paper extends the discussion to incorporate the effects of the Tanzanian tax system (at both corporate and personal level) and non-debt tax shields on the optimal capital structure of Tanzanian firms.

Modigliani and Miller (1958) show that capital structure is irrelevant for a firm operating in competitive efficient capital markets and specify conditions under which various corporate financing decisions are irrelevant. By stating clearly the conditions under which financing decisions have no relevance, they provide a basis for examining how financing choices can create and destroy corporate value. Capital structure theories since Modigliani and Miller (1958) have attempted to illustrate how capital structure is relevant when assumptions on 'perfect capital markets' are relaxed, which is the case in Tanzania.

The rest of the paper is organised as follows. Section two reviews the institutional framework of the Tanzanian tax system. Section three examines the potential impact of the Tanzanian corporation tax system on debt financing. The impact of personal taxes on the use of corporate debt is discussed in section four. Section five, provides a summary of research that has focused on the impact of both corporate and personal tax on capital structure and discuss its implications for Tanzanian firms. Section six examines the impact of non-debt tax shields on an optimal capital structure in Tanzania. Section seven focuses on conclusion and policy implications.

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[1] Other factors include the costs of financial distress, agency costs and the firm's product and input market strategies.

## AN OVERVIEW OF THE TANZANIAN TAX SYSTEM

The Tanzanian tax system can broadly be described as a classical tax system in which a corporation is taxed first and shareholders are additionally taxed on any income they receive.[2] The system is similar in scope to that of the United States but different from the imputation tax systems of the United Kingdom and Australia. With respect to foreign direct investment, Tanzania imposes a tax on all domestic profits that are treated separately from the foreign firm's home taxes. In effect, most foreign firms that trade in Tanzania are subject to double taxation through the Tanzanian tax system and then through their systems.[3] See Price Waterhouse Coopers, 2003 and Price Waterhouse Coopers 2004 for a summary of applicable tax rates.

## Corporation Tax

Corporation tax rate, currently set at 30% is charged on all corporate taxable profits earned by businesses and applies to both resident and non-resident corporate bodies carrying on a business in Tanzania. If a company reports a taxable loss, this can be

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[2] Much of the discussion here is drawn from the UNIDO guidelines on investment in Tanzania.

[3] The Tanzanian government has negotiated treaties with several foreign countries that avoid this double taxation. These countries are Denmark, India, Italy, Norway, Sweden, Kenya, Uganda, Zambia and Finland. Countries with which negotiations are underway include South Africa, Republic of Korea, Zimbabwe, United Arab Emirates, Russia, Seychelles, Mauritius, Egypt, Yugoslavia and Oman.

carried forward for a total of five consecutive succeeding years.[4]

## Non-Debt Tax Shields

A Variety of non-debt tax shields exist for Tanzanian firms. These include an allowance for industrial buildings, which is granted to a firm that incurs capital expenditure on the construction of an industrial building. The rate is 5% of the cost of construction per annum until the whole cost is exhausted. The deduction also applies to certified hotels. Another non-debt tax shield relates to investment. This is granted at a rate of 20% to a firm, which incurs capital expenditure on the construction of an industrial building or the purchase of machinery, which is installed in the industrial building of an approved business. Again, this tax shield also applies to certified hotels. A non-debt tax shield relating to capital expenditure can also be claimed by companies that have incurred capital expenditure in any year of income. This is allowed against profits for the same year of income with a deduction equal to the amount of the expenditure (i.e. 100% expensing of capital expenditure).

Firms that carry out mining operations can receive a tax-shield of 100% on the balance of unredeemable qualifying capital expenditure, which forms part of any deficit brought forward at the commencement of each year of income. In this case, qualifying capital expenditure does not include prospecting capital expenditure or any interest or financial charges. Moreover, this

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[4] An exception is made for the mining industry, which can use the tax-loss carry forward, in subsequent years without restrictions.

non-debt income tax shield is applicable to existing investors only and not to new investors.

Farming activities receive a tax allowance of 20% per annum on capital expenditure incurred on the construction of farm works. However, where the capital expenditure is on farm houses, only one third (1/3) of the expenditure is granted the deduction.

## Income Tax

Incremental individual income tax rates are applicable to sole traders, partners, directors and salaried employees of firms operating in Tanzania. The lowest marginal tax rate is 18.5% while the highest marginal tax rate is 30%. Whereas there are four individual tax rate bands for Tanzania mainland, in Zanzibar, there are eleven. However, the highest and the lowest marginal tax rates are same in both dominions.

All benefits or allowances payable to an employee are taxable, except housing allowance which does not exceed 15% of the basic pay (or TShs. 150, 000 whichever is lower). Similarly, allowances paid to an officer while on official duty are also exempt from income tax.

## Capital Gains Tax

Capital Gains Tax is charged on the gain from the sale of premises or any financial asset. The tax rate is 10% of the difference between the disposal proceeds and the indexed original cost of such premises or financial asset.

## DEBT FINANCING AND CORPORATION TAX

A common criticism of the Modigliani and Miller's (1958) propositions is that they do not consider the impact of corporation tax on cash flows and ultimately firm value. Firms operate in economies that allow the deduction of interest payments for corporation tax purposes. The implication of such provisions is that, after-tax cash flows to suppliers of capital will be higher for a firm that employs debt in its capital structure compared to a firm that does not utilise debt. It is from the strength of this argument that Modigliani and Miller (1963) demonstrated the impact of corporate taxes on a firm's cash flows.

Modigliani and Miller (1963) show that the capital structure irrelevance proposition of Modigliani and Miller (1958) does not hold once the impact of corporate taxes on the value of a firm is considered. In their extended frame- work, the value of a firm is the sum of discounted expected net cash flows. The net cash flows are made up of two major components, the pure investment related net cash flows, (which are equivalent to what could have been produced by an equivalent but unlevered firm) and pure debt related net cash flows, which is the tax shield provided by interest payments.

The insight provided by Modigliani and Miller (1963) is that the value of a firm is positively related to the level of debt employed in its capital structure and accordingly, in the context of perfectly competitive markets, 100% debt financing should constitute the optimal financial structure. As can easily be appreciated, the optimal capital structure as predicted by Modigliani and Miller (1963) is not possible in practice.

Given the unsatisfactory nature of the previous model's empirical implications, further research on the possible factor(s) that

determine leverage has been carried out. In the US, MacKie-Mason (1990) provides evidence of a significant tax effect on the choice between debt and equity for US firms. The paper analyses the relationship between tax shields and debt policy by using two features of the US Corporate Tax Code, namely, tax-loss carry forwards and investment tax credits. MacKie-Mason (1990) argues that tax shields should matter only to the extent that they affect the marginal tax rate on interest deductions. The paper further shows that tax loss carry forwards have a larger effect on the expected marginal tax rate on interest payments since each dollar of tax-loss carry forward is quite likely to crowd out a dollar of interest deductions. In Tanzania, investment tax credits are likely to be more significant than in the US given the 100% tax allowance on capital expenditure.

It is also likely that the two tax shields, tax-loss carry forwards and investment tax credits, will have different predicted effects on a firm's financing decisions given the nature of the companies that report these and the corresponding risks associated with them. Tax-loss carry forwards are likely with firms that are unprofitable or are growing quickly. These firms are unlikely to be able to attract significant levels of debt because of their inherent risk. Tanzanian firms, therefore, with large investment tax credits are likely to have greater debt financing than corresponding companies that report tax-loss carry forwards.

Givoly *et al* (1992) use the US Corporation tax reform of 1986 to analyse the impact of corporation tax on capital structure. They use cross sectional regressions to provide evidence that support tax-based theories of capital structure. Specifically, their findings indicate that corporate taxes and

non-debt tax shields are significant determinants of capital structure. Their results also suggest that personal income taxes would play a role in capital structure decisions and that dividend clienteles exist in the US. The results of Givoly *et al* (1992) can readily be extended to the Tanzanian context. In addition, Givoly *et al*'s insights may also be a reason for why all firms listed on Dar es Salaam Stock Exchange issue dividends to their shareholders.

In an effort to investigate the significance of a tax effect on debt policy, Shum 1996) conducted a study similar to that of Givoly *et al* (1992). Using the tax provision that allows loss carry back and loss carry forwards; she explored the implication of asymmetric corporate taxes on a firm's debt policy using Canadian data. Shum (1996) provides empirical findings that support the argument that corporate taxes have a significant effect on a firm's debt policy.

Graham (1996) tested whether the incremental use of debt is positively related to firm-specific marginal tax rate. He calculates the marginal tax rate using a model that incorporates the effects of tax deductions and tax credits. He uses incremental debt financing decisions (as opposed to cumulative measures of financial policy) in a model that captures the relationship between debt and taxes. Graham (1996) then used a pooled cross-section of differenced time series data for over 10,000 US firms, and provided empirical findings that a firm with a higher marginal tax rate has a greater incentive to issue debt, relative to a low marginal tax rate firm. This implies a positive association between the marginal tax rate and debt financing. Graham's results show also in marginal tax rates across time and across

firms. With respect to net operating losses, his results show that firms do not appear to respond to the tax incentive associated with debt when they have net operating loss carry forwards relative to when they do not.

Patterson (1985) studied the role of taxation on a firm's financial policy and value by using a model in which the value of a levered firm is equal to the sum of values of an equivalent but unlevered firm and the risk adjusted present value[5] of the debt related tax shield. He derives a model in which the optimal level depends on the corporate tax rate and operating risk. His results show that there is a negative relationship between value and leverage variables.

According to Patterson (1985), the effect of taxes on leverage depends on the sign and size of the estimated leverage and operating risk variables. Patterson's (1985) results show that the signs of the estimated coefficients of leverage and operating risk are negative as expected. The interpretation of such results is that the optimal level of debt is zero. Patterson recognises that the theoretical insights provided by his model are not supported by observed capital structures. A question that needs to be answered is that if a value maximising debt ratio is zero, why do firms use debt at all? Patterson argues that the possible explanations for these results are misspecification in measuring variables, sample bias and/or that management has other goals rather than value maximisation.

In general, empirical studies in the US provide evidence that there is a positive association between marginal tax rates and debt financing. The results here would suggest that companies in both US and Tanzania would use debt so long as they have (or expect to have) profits high enough to utilise debt tax shields.

The implication of the above results for Tanzania is that a high level of debt is optimal. According to theory, ceteris paribus, close to 100% debt financing would constitute an optimal financing strategy. However, in practice the proportion of debt in a firm's capital structures will be far less than one. There are a number of reasons that could be proposed to explain why the proportion of debt in the capital structure of Tanzanian firms will be less than one.

One explanation could be that interest income attracts personal tax. The taxation of interest income affects marginal prices of debt instruments and consequently the amount to be raised through debt issues. The argument above suggests that Tanzanian managers need to consider the tax position of the recipients of interest income when they make a decision on their debt policies.

Thus, there is a personal tax disadvantage to corporate debt that reduces the advantage of debt at the corporate level. In the next section we provide a summary studies that consider the impact of personal tax on debt financing and relate these to the Tanzanian context.

## DEBT FINANCING AND PERSONAL INCOME TAXES

In Tanzania, dividends are charged at an income tax rate of between 18.5% and 30% compared to tax on capital gains of 10%. Masulis and Trueman (1988) examine differential personal tax rates to demonstrate

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[5] The present value of the debt related tax shield is adjusted for the costs of using debt.

the personal tax disadvantage of early dividend payouts. They show that the preferred level of dividends depend on a firm's investment opportunities, their required level of financing, and shareholders' personal tax brackets. Investors in positive tax brackets are shown to benefit from dividend deferral and the implication of their study is that, managers need to consider the tax position of security holders in deciding which security (debt or equity) to issue. Surprisingly, most listed firms in Tanzania issue dividends to their shareholders, yet the majority of Tanzanian investors would be better off if their return from equities came in the form of capital gains. This behaviour of managers and the general enthusiasm for Tanzanian investors to prefer dividends to capital gains is indicative of either investor irrationality or some unobserved factor such as transaction costs of trading.

Lewellen and Mauer (1988) investigate the impact of the aggregate value of tax timing options on a firm's value and show that the availability of those timing options to shareholders will be enhanced when a firm has multiple classes of tradable securities outstanding.

Lewellen and Mauer (1988) employ a valuation framework in a multi-period, state-preference setting with the assumptions that a firm's investment strategies are given (i.e. are exogenous) and markets are perfectly competitive. The paper derives the security holders' tax timing options for both levered and unlevered firms. In both cases the equity holder tax option payoff function is equivalent to that of a put option on assets (exercisable at current value) with a random value at a future date multiplied by the applicable capital gain tax rate. Generally,

they show that the value of the tax timing option on shares of an unlevered firm is either less than or equal to the aggregate value of the tax timing options on debt and equity securities of an otherwise identical levered firm. The unlevered firm option value will be strictly less if the tax trading opportunities of the levered firm's bondholders and stockholders are not perfectly synchronous. Thus, according to Lewellen and Mauer (1988) there is a possible advantage of using debt if personal tax is included in the analysis of optimal capital structure. The results of this paper offer an additional tax-based rationale for the existence of a complex corporate capital structure with emphasis on leverage choice.

Lie and Lie (1999) investigate the impact of personal taxation on corporate managers' choices between share repurchases and dividends as a means of disbursing cash. They show that, consistent with the notion that personal taxation influences the choice of disbursement method, managers are more likely to choose share repurchases if the firm has a low dividend yield. The same result may be obtained if the firm's stock has experienced losses or small recent capital gains. The authors provide empirical evidence to support their argument that managers consider the tax situation of the firm's investors in making corporate decisions. The evidence shows that managers are even more sensitive to shareholders' tax situation if institutional investors hold a large fraction of shares in the firm.

We have so far shown that both corporation and personal income taxes affect the optimal capital structure in several ways. The majority of extant research analysed either corporation tax or personal tax

independently. The popular view is that debt has a corporation tax advantage but personal tax structure may reduce or even eliminate that advantage. It is therefore important to look at studies that have analysed the combined impact of both corporation and personal tax on capital structure. This is done in the next section.

## DEBT FINANCING UNDER CORPORATION AND PERSONAL TAXES

Stiglitz (1973) uses the 'relevant' provisions[6] of the 1972 US Tax Code to provide an analysis of the impact of taxation on corporate financial policy. The paper aims to reconcile the capital structures predicted by financial theories with the observed capital structures in the US. Using the cost of capital argument as in Modigliani and Miller (1958), Stiglitz shows that tax induced changes in financial structure have no real effect on the investment decisions of the firm. Using a multi-period model, his results suggest that most firms finance their new investments by retentions, raising additional capital required by issuing bonds. He assumes a 'certainty world' and derives the optimal leverage at both corporate and personal level and shows that at the personal level, the marginal rate of substitution of consumption is equal to the after-tax rate of interest using the personal tax rate.

At a corporate level, Stiglitz's (1973) model indicates that increasing corporate debt, ceteris paribus, increases current consumption but decreases future consumption. Stiglitz (1973) concludes that the optimal financial policy that emerges from an analysis involving both personal and corporate tax

codes is in accord with the observed one. The tax advantage of debt depends on the relative tax savings on personal borrowing versus corporate borrowing. Thus, desirability of a high debt policy depends simply on whether the personal tax rate is greater or less than the corporate tax rate. He argues that it happens only by chance that the actual debt-equity ratio is the outcome of the profit and investment history of the firm. In the absence of bankruptcy, the optimal investment decisions of the firm, whether in safe or risky assets, remain unaffected by the tax structure. The paper shows also that there is no inter-sector inefficiency resulting from an imposition of tax on corporate profit in an economy with a corporation tax system that allows interest charges to be deducted in calculating corporation tax liability.

Miller (1977) presents the argument that the capital structure of the firm is irrelevant even in a world with a tax system that allows the deductibility of interest payments in calculating a firm's taxable income. He introduces the influence of personal tax into the analysis and shows that, the marginal personal tax disadvantage of debt and supply side adjustments by the firm can offset the corporate tax advantage of debt as suggested in Modigliani and Miller (1963). He derives equilibrium market prices for equity and debt instruments in a valuation framework that implies irrelevance of capital structure for an individual firm[7]. In particular, Miller derives

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[6] Similar to Tanzania, the US Tax Code provides for taxation of interest income and dividends at the personal tax rate on ordinary income, whereas taxation of capital gains is at a lower rate.

[7] Modigliani and Miller (1958) do point out that the heavy reliance on debt in their capital structure commits the firm to paying out a substantial part of its earnings in the form of interest. These interest payments are taxed under personal income tax and thereby reduce the total after tax cash flows to stakeholders.

the market equilibrium characterised by corporate sector debt with a perfectly elastic supply curve and upward sloping demand curve. He argues that given a fixed corporate tax rate and progressive personal tax system, in equilibrium (as is the case in Tanzania), there may be no gain from leverage for the individual firm. Each firm category irrespective of its preferred debt level will find that the risk adjusted cost of debt and after tax cost of equity will not only be equal but will also be independent of the level of debt it chooses to employ.

The implication of Miller's (1977) argument is that the market will set market prices such that at equilibrium, the expected after tax return from stock is equal to that from bonds. According to Miller's (1977) results an optimal debt ratio may exist only for the corporate sector as a whole and not for the individual firm.

Schneller (1980) examines the impact of taxes on the optimal capital structure of a firm. The paper argues that when individuals differ in the tax rates imposed on their interest income they will disagree on the level of debt financing and as a result, the assumption that the objective of the firm is to maximise its *value'* is meaningless. The paper considers default possibility in examining the effect of debt financing (for both dividend-paying and earnings-retaining firms) on firm values. It shows that due to the possibility of illiquidity and disparity between capital gains and dividend income tax rates, interior solutions[8] for the capital structure decision of dividends

paying firms may exist. The analysis shows that when dividend-paying firms are always liquid, a solution to the capital structure problem coincides with that of Miller (1977). His results show further that, in the absence of bankruptcy, the optimal capital structure for earnings-retaining firms is always a corner solution, i.e. either debt or equity financing. When bond default is allowed, an interior solution may exist.

DeAngelo and Masulis (1980b) provide a generalisation of the Miller (1977) paper. They consider a number of dimensions in Miller's (1977) framework and conclude their analysis by making the following remarks. First, there are two key properties of the demand-supply interactions of investors and firms, namely *the aggregate supply response and tax induced positive aggregate demand that lead to firm level leverage irrelevance in market equilibrium.* They also show that market equilibrium implies irrelevance of the leverage decision in the valuation of any given firm. They also show that the aggregate supply of corporate debt and equity is socially relevant in the sense that in aggregate, investors demand positive quantities of debt and equity claims in order to arrange their portfolios in a most efficient manner.

Second, the key demand side property reveals that the leverage irrelevance theorem is robust to the alternative assumption about personal tax codes. They argue that no single security-ownership clientele effect is uniquely associated with the theorem. Many different personal tax codes lead to different ownership patterns.

Third, in market equilibrium, leverage is irrelevant for firms that issue risky debt even though part of the corporate debt tax shelter is lost in default and recapture is not allowed.

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[8] An interior solution is the result of an optimisation problem in which the optimal capital structure comprises both debt and equity such that a proportion of each greater than zero but less than one.

Fourth, even in complete markets, the supply side adjustments by firms that are constrained to issue only conventional securities are not always powerful enough to establish equilibrium prices that imply leverage irrelevancy to individual firms.

Finally, when a dividend-specific personal tax shelter exists, equilibrium prices will adjust to imply that any given firm is indifferent among all debt, dividend and capital gain packages of earnings. Without dividend-specific personal tax shelters, dividends will not be supplied or demanded in market equilibrium nor will dividends be held. The implication of their remarks is that when both personal and corporation tax are considered, leverage may be relevant. Their results seem to suggest that it is important to consider personal taxes when deciding on capital structure choice.

In a study particularly relevant to emerging markets like Tanzania, Taggart (1980) extends Miller's (1977) analysis by examining his model under incomplete capital market conditions characterised (among other imperfections) by the costs associated with debt. As in Miller (1977), Taggart (1980) finds that investors have a positive demand for corporate leverage, and that this is curtailed as the taxable interest rate rises relative to the tax-exempt rate. However, unlike Miller (1977) Taggart (1980) shows that the capital structure of any firm is not a matter of indifference to all shareholders at market equilibrium.

Using a certainty model with a fixed supply of security assumption, he constructs a portfolio equilibrium comprising of tax-exempt bonds, fully taxable bonds and equity shares. He shows that, at the margin, a change in the market value of a firm's equity is inversely related to the ratio of the full taxable interest rate to tax exempt rate of return. This result implies that, initial (or existing) shareholders will unanimously prefer more leverage if the pre-tax return on a fully taxable bond, adjusted for corporate taxes is less than the return on tax-exempt bond.

The paper concludes that, incorporating the costs associated with debt in the analysis provides a rationale for capital structure specialisation among firm types or industrial groups and suggests that, a given firm's capital structure is not a matter o indifference. Furthermore, the paper shows that, the incompleteness of capital markets implies that investors will not line up perfectly in tax bracket clienteles and consequently shareholders' preferences for capital structure policy will not be unanimous.

Kane, Marcus and MacDonald (1984) use an option valuation model to determine the magnitude of tax advantage to debt that is consistent with the range of observed corporate debt ratios. Their model incorporates differential personal tax rates on capital gains and ordinary income and gives the conclusion that variation in the magnitude of bankruptcy costs across firms cannot by itself account for the simultaneous existence of levered and unlevered firms. The paper uses simulation analysis to determine a reasonable cross-sectional range for the optimal debt ratios, given the tax advantage of debt.

The simulation results indicate that if the tax advantage of debt is small, then the cost of deviating substantially from the optimal debt ratio is small. They argue that the personal tax rate must be extremely close to the corporate tax rate in order to explain the existence of unlevered firms, and, at those rates, the annual rate of return advantage to debt is small.

Their conclusion is that the trade-off between the tax advantage of debt and its associated bankruptcy costs is unlikely to play a major role in explaining observed leverage patterns. The results, though consistent with observed debt ratios, leave open the possibility of other factors, like moral hazards to be more important determinants of debt policy than the traditional tax and bankruptcy cost considerations.

Schall (1984) describes how the tax effects relating to capital gains and debt interest induce changes in aggregate corporate borrowing under inflationary conditions. He argues that the real tax rate on business income can increase because historic costs rather than replacement costs of inventories and depreciable fixed assets (like plant & equipment) are used in computing taxable income. At an individual level, inflation can increase real personal taxes due to the taxation of shareholders capital gains that are nominal rather than real.[9]

The paper shows that the use of nominal rather than real amounts in tax computations causes the real tax rate on interest income and the real interest tax savings of the borrower to depend both on the nominal interest rate and the inflation rate. Schall (1984) assumes the existence of a "certainty" world in which capital markets are perfectly competitive and transactions are cost less.

Schall's model produces results which show that tax distortions from using nominal

rather than real amounts in tax computations results in a difference in tax equilibria with and without inflation. From the borrowers' point of view, the effects of computing taxable income by using nominal income rather than real income will encourage less borrowing in the economy and will dominate the impact of the resulting effect on shareholders' real taxes, which arguably has the effect of motivating more borrowing.

Flath and Knoeber (1985) relates the size of the net tax subsidy to debt and the direct costs of bankruptcy associated with the use of debt, to variations in capital structure. Specifically they argue that the proposition made in Modigliani and Miller (1958) that *'the value of a firm is independent of its capital structure does not imply that the average cost of capital to any firm is independent of its capital structure'*. They show that if the effects of taxes and bankruptcy costs are considered, the two propositions are not equivalent.

Despite a suggestion by Miller (1977) that the size of net tax subsidy to debt and direct costs of bankruptcy are significantly small, Flath and Knoeber (1985) argue that little has been done to relate these factors to variations in capital structure. They use industry-based cross-sectional regressions to estimate the size of the personal tax advantage to debt and the costs of failure. Taking into account both corporate and personal taxes, the results show that at the margin, the cross-sectional annual tax advantage ranges from 14% to 16% and from 23% to 26% of interest payments for periods 1957-1964 and 1965-1972 respectively. With respect to the failure costs, the results imply that variations in capital structure ought not to be related to proportionate variations in failure costs and income. The results show further that

[9] Schall (1984) shows that the real capital gains tax rate depends on the inflation rate, the length of holding period, the real pre-tax return on asset sand the statutory capital gains tax rate. Thus using historic coat rather than replacement cost overstates the capital gains and hence real capital gains tax rate.

variations in capital structure are best explained by differences in operating risk than by inter-industry differences in the tax advantage to interest. The findings add empirical support that failure costs and taxes do imply an optimal capital structure, at least on an industry level.

Graham (1999) investigates the degree to which personal taxes offset the corporate tax advantage of debt. He presents an empirical validation of the assertion made in other studies (such as Miller (1977)) that '... *in equilibrium, personal taxes on interest income offset the corporate tax advantage arising from deductibility of interest payments for corporate tax purposes*'.

The implication of the above assertion is that a tax-induced, firm-specific optimal capital structure should not exist in equilibrium and he considers this to be a strong argument that justifies a comprehensive study. Consequently, Graham (1999) focuses on the importance of personal taxes in the context of corporate financial decision- making. The paper shows that the personal tax burden on interest income is generally higher than that for equity income because capital gains are often taxed at a lower rate relative to interest income. He also argues that there is a chance of avoiding tax on equity income (capital gains) altogether. Graham (1999) uses cross-sectional regressions that control for personal taxes and finds that debt usage is positively correlated with tax rates.

With properly simulated marginal tax rates[10] and a careful adjustment for the

personal tax penalty, the paper provides results that show strong tax effects on capital structure.

When firm-specific information is used to calculate the personal tax penalty (i.e. using the firm's dividend pay-out ratio), the results show that there is a strong tax effect, in the capital structure regressions; with high tax rate firms having more debt in their capital structures than low tax rate firms. The results offer evidence against the conclusion made in Miller (1977) that there is no tax-induced optimal capital structure. This implies that adjusting for marginal personal tax rates is important in analysing the effects of corporate tax on financial policy.

It should be noted that the studies reviewed so far do not consider in much detail the impact of the presence of other non-debt deductions allowed by the corporation tax system in calculating corporate tax liability. In the next section we examine relevant research that considers the impact of non-debt tax shields m optimal capital structure.

## THE IMPACT OF NON-DEBT TAX SHIELDS ON CAPITAL STRUCTURE

Tanzanian corporations can receive a number of non-debt tax shields. Although several are geared specifically to certain industries, the most notable tax shield pertains to purchase of fixed assets and capital investment. DeAngelo and Masulis (1980a) and Dammon and Senbet (1988) extend the work of Miller (1977) to examine the impact of introducing non-debt deductions allowed for tax purposes on an equilibrium level of debt for individual firm.

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[10] The marginal tax rates are simulated to account for uncertainty in taxable income, as well as the tax loss carry back and forward, investment tax credit and alternative minimum tax features of the US Corporate Tax Code.

They argue that if realistic assumptions about the corporate tax structure are made[11], an equilibrium optimal level of debt for the individual firm might exist even in the context of Miller (1977) framework.

. The DeAngelo and Masulis (1980a) valuation relationship shows that if a firm has a positive corporate tax shields substitute for debt, the relative market prices for debt and equity will adjust until in equilibrium, each firm has a unique interior optimum level of debt. They argue that this unique interior optimum exists because there is a constant expected marginal personal tax disadvantage to debt while the positive tax shield substitute implies that the expected marginal tax benefits decline as debt is added to the capital structure.

An important point to note in DeAngelo and Masulis's (1980a) interior equilibrium is that they assume a constant level of investment and do not explain the relationship between the level of investment and the amount of debt employed.

In Tanzania, this would not be a legitimate assumption since firms are expected to borrow or issue new equity in order to raise funds they need to finance the desired level of investments. The non-debt tax shield (of which a, large proportion is true economic depreciation) is a function of the level of investment and it affects the optimal level of debt in the DeAngelo and Masulis (1980a) framework. It is therefore logical to argue that when debt changes, the level of investment will also change and consequently so will the true economic depreciation and the earnings

generated by the firm.[?] Thus, the states of nature for which firms (Tanzanian firms inclusive) pay tax and the possible tax exhaustion states would need to be examined.

Dammon and Senbet (1988) use an investment-related tax shield argument similar to that used in DeAngelo and Masulis (1980a), to analyse the effect of corporate and personal taxes on a firm's optimal investment and financing decisions. They consider a world of uncertainty in which investment is a decision variable that is not exogenously given as assumed in DeAngelo and Masulis (1980a). They show that, an increase in investment related tax shields due to an increase in tax is not necessarily associated with a decrease in leverage at the individual firm level. Dammon and Senbet (1988) introduce a model in which the non-debt tax shield (true economic depreciation) depends on the level of investment, which then determines the net cash flows to shareholders.

They conclude that the impact of leverage on a firm's value due to DeAngelo and Masulis's (1980a) 'pure leverage effect' which allows only debt (and not investment) to vary, will be strictly less than 'the total leverage effect' which requires simultaneous optimal adjustments to all firm's decision variables. They suggest that the effect of a change in investment related tax shields on a firm's optimal level of debt depend critically on the trade off between the 'substitution

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[11] Most Corporation tax structures allow the deduction of non-debt items such as depreciation, qnd capital allowances in arriving at taxable profit.

[12] This assertion assumes that the ratio of equity to debt (if any) required to finance investment remains unchanged. For a more detailed explanation on the impact on equilibrium of including investment as a decision variable (endogenous to the model) on the optimal level of debt see Dammon and Senbet (1988).

effect' proposed by DeAngelo and Masulis (1980a) and the 'income effect' associated with a change in optimal investment.

The substitution effect between non-debt tax shields (mainly depreciation or capital allowances) and debt exists because non-debt tax shields shelter part of taxable profit and firms should only borrow to an extent that they have profit to shelter from corporation tax. Thus, at a given level of profits and non-debt tax shields, lower debt levels will be utilised by firms with more of non-debt tax shields.

On the other hand, Damnon and Senbet (1988) show that non-debt tax shields are related to investment and therefore more investment will generate more non-debt tax shields and more profit hence more debt capacity. In this case more non-debt tax shields will be associated with more debt due to more profit resulting from more investment, hence the term 'income effect'. Their results show that in a cross sectional analyses, firms with higher investment related tax shields need not have lower debt related tax shields if they utilise different production technologies and have less than perfectly correlated pre-tax earnings.

Cordes and Sheffrin (1983) estimate the effective tax value of incremental interest deduction for corporations.[13] They estimate the effective tax rate as the ratio of a change in corporate tax liabilities to a change in interest deductions. They find that the estimated effective tax rate is less than the statutory corporate tax rate and they attribute it to an inability of corporations to utilise fully their interest deductions due to insufficient taxable income or availability of non-debt tax shields.

The paper estimates the marginal effective tax advantage to debt finance by using a model that simulates the impact of increasing interest deductions (holding investment and production decisions constant) on the effective marginal tax advantage. Their results show that there is a significant wedge between the statutory and effective tax advantage to debt, and that there is a significant variation in the marginal tax of debt faced by different firms and industries.

Lewis (1990) examines multi-period corporate financial policy in a world where taxation is the only market imperfection. The corporate financial policy in this setting is interpreted as a strategy that generates a state contingent sequence of debt financing choices over the life of the firm, which determines both capital structure and maturity structure of the debt.

The paper assumes that dividends and capital gains and losses are non-taxable and that corporate claims follow the 'interest first' doctrine. Using these assumptions the paper presents a valuation model in a multi-period framework, which illustrates that for a firm, which maximises its value, debt maturity structure is irrelevant once the promised interest is specified.

Lewis (1990) also shows that corporate financial policy affects firm value since the categorisation of cash payouts as interest or *'others'*[14] influences both the corporate tax deductibility of payouts and the market value

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[13] Other studies that estimate the effective corporate tax rate by incorporating realistic features of the specific corporate tax code are Graham (1996a), Cooper and Franks (1983), Givoly et al (1992) etc.

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[14] Other payouts in this case include principal, dividends, repurchases, etc.

of those payouts. The optimal financial policy in this system is similar to that of DeAngelo and Masulis (1980a), with the difference that there can be many debt-to-asset ratios, rather than a single ratio that is consistent with value maximisation. Thus, the optimal debt to assets ratio is not unique under the multi period model. Lewis (1990) shows further that capital structure relevance is a direct consequence of an optimal financial policy that involves debt financing. This implies that taxes are relevant considerations in determining the optimal financial policy.

## TAXATION AND CAPITAL STRUCTURE: IMPLICATION FOR TANZANIA

In this paper, the tax theories of capital structure were reviewed and discussed within the Tanzanian context. The review started with the basic framework without market imperfections as presented in Modigliani and Miller (1958). The remainder of the theories reviewed focused on the impact of including tax (at both corporation and personal levels) on the capital structure decision. How do the theories discussed here provide insights into the effect of the current taxation system on the capital structure of Tanzanian firms?

Much of the research that has been carried out on overseas markets can be applied to the Tanzanian environment. However, great care must be taken to filter out the unique characteristics of the Tanzanian tax system and the inherent inefficiencies in the Tanzanian business environment. To sum up, the relevant insights provided by the work discussed in this paper indicate that there is indeed a corporate tax advantage to debt for Tanzanian firms. There is also a net tax advantage to corporate debt, which depends

on both the personal and corporation tax rate and the effective tax rate of investors will have an impact on how attractive debt is.

The existence of non-debt tax shields in the Tanzanian tax system (especially those related to investments) will have an impact on debt levels and these will depend on both the substitution and income effects of non-debt tax shields received by individual Tanzanian firms.

Similar to developed markets, it is likely that Tanzanian firms will have long-term target borrowing ratios and that they adjust to their target ratio relatively fast. This would also suggest that an optimal capital structure of some form exists for Tanzanian firms, and variables like size, liquidity, profitability and growth opportunities would play a significant role in the optimal capital structure.

Lie and Lie (1999) suggested in their study that managers consider the tax position of their shareholders in deciding a method of disbursing cash. The implication of the argument is that whenever shareholders are in higher tax bracket and/or the firm has low dividend yield managers are likely to choose share repurchase rather than dividends as a way of disbursing cash. According to tax argument, managers of firms listed in Dar es Salaam Stock Exchange (DSE) are expected to be more likely choose share repurchase as a method of distributing earnings. However, this is not the case at DSE. Firms distribute earnings in form of dividend despite the fact that share repurchase seem to be an optimal method of disbursing cash given the fact that an effective capital gain tax is zero and most shareholders of the companies listed at DSE pay tax at either personal or corporate level. A possible explanation of this situation is that given the current share ownership structure

at DSE, share repurchase is likely to be unpopular. A significant proportion of shares is held by corporations like insurance and pension funds who expect regular income to finance their daily expenditures. In other words, most shareholders at DSE are income oriented shareholders and paying dividends is in line with the preference of majority shareholders. Whether this is real optimal to the share holders is subject to empirical study.

Due to a scarcity of good quality data for Tanzanian companies, it is extremely difficult to empirically determine how the Tanzanian tax system actually affects firm capital structure. It could be argued that some work could be carried out by examining the capital structure of the six listed companies on the Dar Es Salaam Stock Exchange. Several problems exist in this context. First, five of the listed firms were privatisations of government operations and as a result, the capital structure of these firms may not be representative of the population distribution of private companies in Tanzania. Second, unfortunately the only remaining firm, TATEPA, is relatively young and may not yet have reached their target capital structure. An examination of TATEPA's capital structure may be misleading and lead to erroneous conclusions.

Even though it may be exceptionally difficult to empirically verify the theories discussed in this paper in the Tanzanian context, concern should still be focussed on whether there is an optimal capital structure for firms and whether existing capital structures in Tanzania are at or anywhere near optimal levels. This paper provides some insight into the concerns that management face and should also suggest some ways in which they can maximise firm value, not only through good investment decisions but also through the correct mix of debt financing in their firm's capital structure.

## REFERENCES

Cooper, 1. and Franks, J.R., (1983) The Interaction of Financing and investment Decisions when Firm has Unused Tax Credits", *The Journal of Finance,* Vol. 38,

Cordes, J.J., and Sheffrin, S. M., (1983) "Estimating the Tax Advantage of Corporate Debt", *The Journal of Finance,* Vol. 38, pp.95-105.

Craig, M. L., (1990) "A Multi-period Theory of Corporate Policy under Taxation", *Journal of Financial and Quantitative Analysis,* Vol. 25, No.1, pp. 25-43

Dammon, R.M., and Senbet, L.W. (1988) The Effects of Taxes and Depreciation on Corporate Investment and Financial leverage", *The Journal of Finance* vol.43, pp.357-373.

DeAngelo, H. and Masulis, R.W., (1980A) "Optimal capital structure under corporate and personal taxation", *Journal of Financial Economics,* Vol.8, pp.3-29.

DeAngelo, H. and Masulis, R.W., (1980b) "Leverage and Dividend Irrelevancy under Corporate and Personal Taxation", *The Journal of Finance,* vol.35, pp.453-464.

Flath, D. and Knoeber, C.R., (1985) "Taxes, Failure Costs and Optimal Industry Capital Structure: An Empirical Test", *The Journal of Finance,* Vol.35, 1, pp. 99-117.

Givoly, D., Hahn, C., Ofer, A., and Sariq, O., (1992) "Taxes and capital structure: Evidence from firms" response to tax reform choice of 1986", *Review of Financial Studies,* Vol.5, pp. 331-355.

Graham, J. R., (1996b) "Proxies for the Corporate Marginal Tax Rate", *Journal of Financial Economics,* Vol. 42, pp. 187-221.

Graham, J.R., (1996a) "Debt and Marginal Tax Rate", *Journal of Financial Economics,* Vol. 41, pp. 41-73.

Graham, J.R., (1999)
"Do Personal Taxes affect Corporate Financing Decisions?" *Journal of Public Economics*, Vol. 73, pp.147-185.

Kane, A., Marcus, A.J., and MacDonald, R. L., (1984)
"How Big is the Tax Advantage to Debt", *The Journal of Finance*, Vol. 39, pp.841-853

Lewellen, W. G. and Mauer, D.C., (1988)
"Tax Options and Corporate Capital Structures", *Journal of Financial and Quantitative Analysis*, Vol. 23, No.4, pp.387-400.

Lie, E. and Lie, H., (1999)
"The Role of Personal Taxes in Corporate Decisions: An Empirical Analysis of Share Repurchases and Dividends," *Journal of Financial and Quantitative Analysis*, Vol. 34, No.4, pp. 533-552.

MacKie-Mason, J.K., (1990)
"Do Taxes Affect Corporate Financing Decisions", *The Journal of Finance*, Vol. 45, pp. 1471-1493.

Masulis, R.W. and Trueman, B., (1988)
"Corporate Investment and Dividend Decisions under Differential Personal Taxation", *Journal of Financial and Quantitative Analysis*, Vol.23, No.4, pp.369-385.

Miller, M.H, (1977)
"Debt and Taxes", *The Journal of Finance*, Vol. 32, 3p.261-275.

Modigliani, F.F and Miller, M.H., (1958)
"The cost of capital, Corporation finance, and the Theory of investment," *American Economic Review*, Vol. 18, pp.261-297.

Modigliani, F.F., and Miller, M.H., (1963)
"Corporation Income Tax and the Cost of Capital: A correction, *American Economic Review*, Vol. 53, pp. 433-443.

Patterson, C. S., (1985)
"Debt and Taxes: Empirical Evidence" *Journal of Business Finance and Accounting*, Vol.12, No.2, pp. 187-206.

Schall, L.D., (1984)
"Taxes, Inflation and Corporate Financial Policy", *The Journal of Finance*, Vol.39, pp. 105-126.

Schneller, M.I, (1980)
"Taxes and optimal Capital structure of the Firm", *The Journal of Finance*, Vol. 35 pp. 119-127.

Shum, P.M, (1996)
"Taxes and Corporate Debt Policy in Canada: An Empirical investigation", *Canadian Journal of Economics*, Vol.29, pp.556-572.

Stiglitz, J.E., (1973)
"Taxation, Corporate Financial Policy and the cost of Capital", *Journal of Public economics*, vol.2, pp.1-34.

Taggart, R.A. Jr, (1980)
"Taxes and corporate Capital Structure in an Incomplete Market", *The Journal of Finance*, vol.35, pp.645-659.

Titman, S., (2002)
"The Modigliani and Miller theorem and the integration of financial markets, *Financial Management*, Vol. No. pp. 101-115.

Price Waterhouse Coopers, (2003)
"East African Tax Reference Guide 2003-2004" Price Waterhouse Coopers publications, pp. 1-9.

Price Waterhouse Coopers, (2004)
"Tax bites" Price Waterhouse Coopers publications, Issue No. 03, pp. 1-11.

Tanzania Revenue Authority (TRA) publications at www.tra.go.tz/info_rates.htm