Determinants of Capital Structure: Panel Data Evidence from Dar es Salaam Stock Exchange

S.M. Kapaya[1]., P. Ngatuni[2] & T. Katunzi[3]

Department of Accounting and Finance,
Faculty of Business Management,
The Open University of Tanzania
Emails; saganga.kapaya@out.ac.tz[1], proches.ngatuni@out.ac.tz[2] and tumainik7@gmail.com[3]

Abstract

This study jointly investigated the relationship of a set of capital structure determinants; namely asset tangibility, size of firm, profitability of firm, growth opportunities, going concern, risk of bankruptcy and non-debt tax shields. It employed both static and dynamic regression techniques to account for static and dynamic effects on total gearing of firms listed on the Dar es Salaam stock exchange. The results indicated that firms have high debt adjustment costs; as a result, adjustment speeds towards optimal capital structure were low. It confirmed that most capital structure determinants were statistically significant. Their role accounted for about 0.798-0.928 of variations in the capital structure variability. Particularly, size of firm, profitability of firm and going concern, were negatively related to capital structure gearing while growth opportunities and non-debt tax shields were positively related to capital structure gearing.

Key words: Capital structure determinants, adjustment costs and costs, Dar es Salaam Stock Exchange

Introduction

Capital structure is a particular combination of debt and equity financing of a firm (Myers, 1984). Capital structure variability has been a focus of study by various researchers around the world. Some significant researches in this area are Myers (1984), Rajan and Zingales (1995), Booth et al. (2001), Alonso (2003), Hall et al. (2004), Ilyas (2008), La Rocca et al. (2009), Hernádi (2014) and Talebnia et al. (2014). In Africa some researches are Abor (2008), Hove & Chidoko (2012), Nyamora (2012), Ayanda et al. (2013), Gweyi et al. (2013), Gathogo and Ragui (2014), Mbulawa (2014) and Tarus et al. (2014). In Tanzania some researches are Bundala (2012), Bundala and Machogu (2012). Several factors affecting capital structure have been studied in these studies. These include firm size, profitability, going concern, asset tangibility, growth opportunities and business risk; just to mention a few. There is scanty research, so far, in this area in Tanzania.

For instance, Bundala & Machogu (2012) analysed factors affecting capital structure of listed firms but did not involve panel data analysis. Their paper was based on Bundala (2012) cross-sectional research study, in which he used six determinants of capital structure, namely size of the firm, profitability of the firm, growth rate, assets tangibility, liquidity of the firm, and dividend pay-out. He found that profitability and assets tangibility were two key determinants of the capital structure decisions of the firms listed in Tanzania, while size of the firm and liquidity of the firm wereindicative determinants. Based on his findings he recommended that, internal financing should be preferred to external financing. The findings advanced so far, on factors that influence capital structure variability are difficult to generalize to other countries such as Tanzania, because of differing contexts, methods used, financial and economic environments. For

instance, comparable studies in Europe, such asthat of Green et al. (2002), Esperança et al. (2003), Hall et al. (2004), La Rocca et al. (2009) and Apostu (2010) have reported mixed results. In Africa, Ogbulu and Emeni (2012) in Nigeria, Moyo (2013) in South Africa, and Tarus et al. (2014) in Kenya reported mixed results in terms of directions and magnitudes of effects of these factors on capital structure variability. Therefore, the main objective of the study was to assess the dynamic nature of debt financing in capital structure among listed non-financial firms in Tanzania. Empirical studies evidence that profitability, asset tangibility, firm size, bankruptcy risk, growth opportunities and tax shields affect capital structure(Oh et al., 2014).The evidences on these factors vary across countries, sectors and firms within a given industry due to attributes specific to a firm (Vries, 2010). Below, we review several factors, and show how they affect capital structure.

Tangibility refers to the degree to which firm's assets are tangible, physical or material in nature. Assets such as property plants and equipment are more tangible while goodwill, brand names and skills or expertise are less tangible. From a theoretical point of view, the type of asset structure of a firm affects its capital structure (Vries, 2010, p. 59). Consistent with former empirical evidences (e.g. Titman &Wessels, 1988), studies establish a positive relationship between the proportion of tangible assets and the level of debt (e.g. Apostu, 2010). Similarly, some researchers in Africa have found a positive relationship between asset tangibility (asset structure) and capital structure ratios (Abor, 2008; Khediri & Daadaa, 2011; Hove & Chidoko, 2012; Gweyi et al., 2013; Umer, 2013). A large amount of tangible assets increase the ability of a firm to issue secured debt (Booth et al., 2001). However, consistent with the evidence of Booth et al. (2001), a few researchers in Africa found a negative relationship between asset tangibility and capital structure ratios (e.g. Vries, 2010;

Doku, et al., 2011; Aremu et al., 2013; Bundala & Machogu, 2012; Chechet et al., 2013; Latridis & Zaghmour, 2013; Moyo, 2013). The justification that has been put forward is that agency costs of debt increase when assets cannot be collateralized (Apostu, 2010; Vries, 2010). Thus, creditors place stringent terms, leading firms to use equity rather than debt.

It refers to the currency value of assets. It tells how big a firm is, and captures the idea of capacity (Ogbulu & Emeni, 2012; Oh et al., 2014). It can affect positively or negatively capital structure ratios. Most empirical studies in Europe, Australia and America report a positive relationship between size and capital structure ratios (Frank & Goyal 2002; Apostu, 2010). Several studies in African countries (e.g. Kenya, Nigeria, Ghana, Ethiopia, Zimbabwe and Tanzania) have indicated a positive (e.g. Abor, 2008; Doku, et al., 2011; Khediri & Daadaa, 2011; Hove & Chidoko, 2012; Nyamora, 2012; Ogbulu & Emeni, 2012; Bundala & Machogu, 2012; Aremu, et al.,2013; Gweyi et al., 2013; Latridis & Zaghmour, 2013; Nyanamba et al.,2013; Umer, 2013; Gathogo & Ragui, 2014). This relationship attributes to the fact that asset size attracts lenders. However, a few studies are there that find a negative relationship. For instance, Vries (2010) & Achy (2009) The negative relationship attributes to low information asymmetry presented by large firms, "control rights" affect small firms and firms with large amounts of tangible assets already have a stable income that pushes them to resort to internal financing rather than debt financing.

Profitability refers to the level of profit generation over years in relation to its assets value (La Rocca et al., 2009; Apostu, 2010; Tarus et al., 2014). The relationship between capital structure and profitability of a firm is theoretically and empirically in two ways.

First, as firms prefer to obtain financing through internally generated fund, because of its relatively lower costs, capital structure ratios negatively relate to profitability (Apostu, 2010). Empirical evidence from previous studies supported both negative and positive relationships between profitability and capital structure ratios (Apostu, 2010). Evidences for a negative relationship are extensive (e.g. Rajan & Zingales, 1995; Booth, et al., 2001; Fama & Frech, 2002; Abor, 2008; Vries, 2010; Khediri & Daadaa, 2011; Hove & Chidoko, 2012; Aremu et al., 2013; Latridis & Zaghmour, 2013; Umer, 2013; Tarus et al., 2014). The rationalization for the negative relationship is that if the firm is following a perking order financing behaviour then firms would prefer internal financing to external ones (debt) (Apostu, 2010; Vries, 2010). Empirical evidence for a positive relationship are equally extensive (e.g. Achy, 2009; Doku, et al., 2011; Nyamora, 2012; Gweyi et al., 2013; Moyo, 2013; Gathogo & Ragui, 2014). The justifications for the positive relationship are that first, if a firm is influenced by cost-benefit trade-offs behaviour in its financing, then more profitable firms will prefer debt financing in order to benefit from debt tax shields (Apostu, 2010; Vries, 2010). Secondly, if past profitability acts as a proxy for future profitability, more profitable firms are capable of borrowing more because of their increased likelihood of ability to pay back the loans (Vries, 2010).

Growth opportunities refers to potential for a firm to grow in value, size and profitability. It ultimately captures the scalability and potentiality of the firm (Jairo, 2006; Nyamora, 2012; Oh, et al, 2014). High growth opportunities firms have high information asymmetry. Thus, one would expect these firms to have less debt in their capital structures, because lenders will shy away from these firms. Additionally, firms with high growth opportunities will retain financial flexibility through a low leverage in order to be able to exercise those opportunities in subsequent years. Firms with high

growth opportunities (i.e. higher market-to-book ratio) would prefer to finance by equity leading to a negative relationship between growth opportunities and debt ratios. A positive relationship of growth opportunities to capital structure ratios has also been widely argued (e.g. Doku, et al., 2011; Bundala & Machogu, 2012; Hove & Chidoko, 2012; Nyamora, 2012; Ogbulu & Emeni, 2012; Gweyi et al., 2013; Latridis & Zaghmour, 2013; Nyanamba et al.,2013). They observe that, such a relationship results because, small size firms have higher funding needs for acquiring more of non-current assets, because they need to grow. Going concern refers to the degree to which a firm will continue to exist in a near future. The length of time in operation normally determines the going concern of the firm (Alonso, 2003; Apostu 2010; Nyanamba et al., 2013). Abor (2008) argues that age of the firm is a typical measure of reputation in capital structure models. As a firm continues longer in operation, it initiates itself as a continuing business concern and therefore increases its debt capacity.

Going concern is proxied by firm's age. Age has been traditionally included among the factors that determine capital structure. Petersen and Rajan (1994) found that aged firms maintain higher capital structure ratios, because of accumulated reputation. Hall et al. (2004) and Green et al. (2002) established that age is positively related to long-term capital structure ratios but negatively related to short-term capital structure ratios. Older firms can present a good credit history and become good candidates for loans (Abor, 2007). However, notably Esperança et al. (2003) found that age is negatively relates to both long-term and short-term capital structure ratios. Young age and information asymmetry presented by the firms is the reason for this relationship. Bankruptcy risk refers to the degree to which a firm's level of debt usage attracts bankruptcy proceedings. Higher use of

debt leads to higher level of bankruptcy risk proceedings (Kremp et al., 1999; Booth et al., 2001). Firms with high debt levels have higher volatility of net profit and implicitly higher bankruptcy risk. High bankruptcy risk leads to less use of debt, as a mechanism to avoid bankruptcy. Level of risk is one of the primary determinant of capital structure (Abor, 2007). Research evidences indicate that firms tend to shy away from excessive debts in order to reduce their bankruptcy risk. (Alonso, 2003; Abor, 2008; Moyo, 2013; Umer, 2013; Gathogo & Ragui, 2014). The rationalization put forward is that, bankruptcy risks emanate from both increases in direct and indirect financial distress costs. The direct costs include all the costs of bankruptcy, which are cash outflows of legal and administrative fees. Indirect costs are non-cash firms' economic losses resulting from bankruptcy (Vries, 2010). Firms increase their debt level because of tax benefits, their ability to meet fixed interest payments decreases (Abor, 2007).

Such a situation increases the risk and cost of bankruptcy for such firms. Firms that adjust their capital structure away from excessive debt reduce the risk and cost of bankruptcy. Firms with high profitability and risk averse attitude tend to avoid debt usage by relying on internal financing in order to reduce bankruptcy risk. The tax shelter-bankruptcy cost theory of capital structure determines a firm's optimal capital structure ratio as a function of business risk. In the presence of agency and bankruptcy costs, there are no incentives for a firm to utilise the tax benefit of 100% debt within the static framework model (Abor, 2007). Unlike debt tax shield, non-debt tax shield refers to the profit size consequences that results from tax savings that result from deducting items such as depreciation costs and finance costs in determining taxable income (La Rocca et al., 2009). Unlike in the case of debt tax shields, De Angelo and Masulis (1980) make a case for non-debt tax shield arguing that, firms that are capable of decreasing taxes by means other than interest expense

deductions will employ less debt in their financing structures. For that reason, if a firm has a huge amount of non-debt tax shields, such as depreciation, its likelihood of negative taxable income is higher and its amount of debt will not increase for tax reasons. Thus, debt level should negatively relate to the level of non-debt tax shields (La Rocca et al., 2009). Empirical evidences both in developed and in developing economies have persistently indicated a negative relationship between non-debt tax shields and capital structure ratios (Abor, 2008; La Rocca, et al., 2009; Khediri & Daadaa, 2011; Hove & Chidoko, 2012). On the contrary, but consistent with the findings of Titman and Wessel (1988), Umer (2013), found a positive relationship between non-debt tax shields and capital structure ratios, in Ethiopian companies. The possible explanation put forward was that non-debt tax shields (tax deduction for depreciations) were not a substitute for debt tax shield. The following seven hypotheses tested the significance of the independent variableseffects on capital structure of firms listed at Dar es Salaam stock exchange.

H1: *Tangibility of the firm's assets positively affects capital structure of companies listed in Tanzania*

H2: *Size of the firm does not affect capital structure of companies listed in Tanzania*

H3: *Profitability of the firm does affect capital structure of companies listed in Tanzania*

H4: *Growth opportunities of the firm does not affect capital structure of companies listed in Tanzania*

H5: *Going concern of the firm positively affects capital structure of companies listed in Tanzania*

H6: *Bankruptcy risk of the firm negatively affects capital structure of companies listed in Tanzania*

H7: *Non-debt Tax shield of the firm negatively affects capital structure of companies listed in Tanzania*

Methodology

The study bases on a population of registered companies in the Dar es Salaam Stock Exchange (DSE). The exchange was incorporated on September 1996 and trading started in April 1998. It is located in Dar es Salaam Tanzania and is organised into two segments; one, the main investment market segment (MIMS) which is the main exchange and; two, the enterprise growth market (EGM) (Dar es Salaam Stock exchange, 2014). The exchange in monitored by the Capital Market and Securities Authority (CMSA) (Norman, 2010). The stock exchange, as of 29/07/2015, comprised 22 companies that list on both segments. The MIMS had listed 19 companies, while EGM had list3 companies. Both segments are composed as follows 15 local companies from Tanzania and 7 cross-listed companies (6 from Kenya and 1 from United Kingdom) (Dar es Salaam Stock Exchange, 2015, "Listed companies", para.1-2).

The sampling frame for the study was all 22 listed and cross-listed companies. The study sample drew from these listed and cross-listed companies in the Dar es Salaam Stock Exchange, for the years 1997-2014. The study observed variables across years for the past maximum of 17 years, thus maximizing on the number of observations (firm years) from the population, which is arrived at by adding the total number of years in operation for each firm since first listing or cross listing at DSE. The 22 companies in the study population observations were subject to different exclusion and inclusion criteria. Applying the criterion, the following companies were excluded. Six highly regulated companies, i.e. banks and insurance companies. This criterion alone excluded six companies. A company must have been consistently listed. This criterion excluded

one company, which was delisted. Availability of data was another criterion, which eliminated four companies, data for which were not available. Eleven (11) companies were excluded leaving a sample size of 11 companies, which were finally included in the study. Thus, the *maximum* number of sample observations (firm years) were 128, constructed from 11 companies that meet the above inclusion criteria. The data was extracted from companies' annual reports, which normally include the following statements; the statements of financial position, the income statements, the statements of change in equity and the cash flow statements. These statements provided data for calculation of ratios and indices, which were used to measure capital structure and the various factors that affect capital structure. The notes on these statements, management reports on the operations of the companies and DSE market reports provided qualitative information of the nature and operations of the companies under study.

Due to data limitations, many studies measure capital structure in book values rather than in market values. The ratio of total debt to total capital (defined as total debt plus equity or only equity) best represent the effects of past financing decisions. Thus, the study involved one capital structure measure, debt ratio measured as the ratios of book values of debt to the sums of total equity values and total debt values (TGEAR) as used by Apostu (2010) consistent with previous studies (e.g. Mayer & Whittington, 2003; Alonso, 2003; La Rocca et al., 2009; Qian et al., 2010). Independent variables included a lagged variable in the dynamic model (L.TGEAR).The study used several firm specific characteristics as conventional variables in order to address alternative explanations for the expected results as well as clearly determine their effects on capital structure. The determinants or independent variables to be used in this study are based on a ratio

scale coding as follows; Tangibility: Non-current assets (NCA) or property, plants and equipment (PPE) to the book value of total assets (TA) that is (PPE/TA) and this was symbolised by TANG(La Rocca, et al. 2009; Apostu, 2010). Firm's size: natural logarithms of sales revenue or natural logarithms of total assets, that is ln (Sales) or ln (TA) and this was symbolised by SIZE (Alonso, 2003; La Rocca, et al. 2009). Profitability was defined as ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to the book value of total asset ratio i.e. EBITDA/TA or EBIT/TA. This was symbolised by PROF (Apostu, 2010; Vries, 2010; Oh, et al. 2014). Growth opportunities: Sales annual growth was symbolized by GROP (Apostu, 2010; Oh et al. 2014). Going concern: Age of the company used the number of years in operations symbolized by GOCO (Alonso, 2003; La Rocca, et al. 2009; Apostu, 2010). Non-debt Tax Shield: depreciation and amortization (DA) divided by total assets (TA) that is DA/TA and is symbolised as NDTS (Booth, et al. 2001; Alonso, 2003; La Rocca, et al. 2009; Apostu, 2010).

Bankruptcy risk/Financial distress: Earnings volatility as a percentage change of earnings (operating incomes) or earnings change as percentage, that is %Δ (EBITDA) or ΔEBITDA/%ΔSales, and is symbolised by RISK(Alonso, 2003; La Rocca et al. 2009; Apostu, 2010). The regression techniques incorporate industry and time dummies to control for the threat of omitted variable biases, and pool different firms into one single sample. Fixed Effects (FE), Random Effects (RE) and General Method of Moments (GMM) analyses were done, to assess suitability of models to the data. The study applied these techniques on both the static and dynamic (with lagged dependent variable) regression Models, as indicated in model (1) and (2) below. Wald and F tests were used to test the joint significance of the time dummy variables, and the joint significance of the reported

determinants.We adopted two regression models, the static and dynamic model to compare results for a better fit of data.

$$D_{i,t} = \alpha_{i,t} + \beta X_{i,t} + d_t + v_i + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$D_{i,t} = \alpha_{i,t} + \delta D_{i,t-1} + \beta X_{i,t} + d_t + v_i + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where;

$D_{i,t}$: Capital structure {GEAR} of firm i in year t,

$D_{i,t-1}$: Lagged dependent variable

$X_{i,t}$: A set of capital structure determinants ($TANG_{i,t}$, $SIZE_{i,t}$, $PROF_{i,t}$, $GROP_{i,t}$, $GOCO_{i,t}$ $RISK_{i,t}$, $NDTS_{i,t,}$)

β: A vector of constants for conventional variables

δ: A constant for lagged dependent variable

d_t: Time-effect dummies

v_i: Industry-effect dummies

$\varepsilon_{i,t}$: The error term for unobserved heterogeneity conditions

Model (1) is a static regression model while Model (2) is a dynamic regression model.

A comparison of models i.e. the fixed effects and rondom effect models using Hausman test indicated that the fixed effects models were able to best fit the data than the rondom effects models. This was due to the evidenced individual and time effects in the data. The variance inflation factor (VIF) mean was 1.3, which was way down from 5.0 recommended points. It indicated the absence of multicolinearity problems in our panel data. The Breusch-Pagan/Cook-Weisberg test for heteroscedasticity (L-M test)(Chi2=13.3, prob.0.0003) indicated the presence of heteroscedasticity in the panel data. The data indicated the presence of first order autocorrelation. This was ascertained by the use of Wooldridge test for autocorrelation

(F=32.757, prob.=0.0002). Second order autocorrelation is considered a problem in macro panels with long time series over 20-30 years. This study's data has only a maximum range of 17years, thus the later issue did not cause estimation problem in the panel (Torres-Reyna, 2007). The study applied advanced techniques to control for these problems. The control introduce more sophisticated regression techniques. These are the least square dummy variable one (LSDV1) with clustered standard errors (CSE) and Prais-Winsten adjusted clustered standard errors (PCSE) fixed effects regressions and general methods of moments (GMM) techniques. The GMM adopted the Arlehando and Bond (GMM_ab) and the Blurndel and Bond (GMM_bb) techniques. We estimated the dynamic model using five different techniques. Fixed effects model estimated by the Least Squares Dummy Variable One (dLSDV1). Fixed effects model estimated by the Least Squares Dummy Variable (LSDV1) with clustered standard errors (CSE).

Prais-Winsten regression with (PCSE) approach all three with lagged TGEAR values and the two Generalized Method of Moments (GMM) approaches using the Arellano-Bond (1991) and the Blundell and Bond (1998) dynamic panel-data estimations as used by La Rocca et al (2009) and Apostu (2010). The GMM estimators are considered to be robust because. (1) They eliminate the companies' non-observable individual specific effects given the estimate in first differences. (2) They control for the possible endogeneity as the lagged values of the endogenous explanatory variables work as instruments.In addition (3), they eliminate the problem of correlation between the lags of the dependent variable and the error term. We tested the validity of the instruments using Sargan's statistic that tests for over identifying restrictions. This helped to control for endogeneity problems and ensure consistent, reliable and unbiased results. La Rocca et al. (2009) particularly insist that the panel-data methodology and estimation by

the Generalized Method of Moments (GMM) together for studies of the dynamic nature of capital-structure decisions at the firm level help to eliminate unobservable heterogeneity and controlling for the endogeneity problem.

Findings and Discussion

The analysis bases on 128 observations. A panel of a total of 17 years from 1997 to 2014was constructed. The panel was unbalanced as the availability of a sizable balanced panel was difficult to obtain. It makes up a total of 11 companies; 8 local companies and 3 cross-listed companies. These companies were; Precision Air Limited (PAL), Tanga Cement Limited (SIMBA), Swissport Tanzania Public Limited Company (SWISSPORT), Tanzania Tea Packers Limited (TATEPA), Tanzania Breweries Limited (TBL), Tanzania Cigarette Company (TCC), TOL Limited (formerly Tanzania Oxygen Limited (TOL)) and Tanzania Portland Cement Limited (TWIGA); which are locally listed at the Dar es salaam stock exchange (DSE). Cross-listed companies included are African Barrick Gold (X_ACACIA), Kenya Airways (X_KQ) and National Media Group (X_NMG). The analysis indicated that, the mean total gearing for the sample was 47%.

The companies on average were moderately geared Table 1. The standard deviation of 0.25 indicated absence of capital structure inertia among these firms. The panel for gearing is comparable to that of La Rocca et al. (2009) who found that companies were moderately geared with a mean of 44.5%. Similarly, Latridis and Zaghmour (2013) based on a comparative study for Moroccan and Turkish firms find the standard deviations to be 0.1693 and 0.1741 respectively and the means of 9.19% and 13.75% respectively. Akinyomi and Olagunju (2013) based on a sample of 240 observations found a mean gearing of 57.6% and standard deviation of 0.074 for firms listed in Nigeria.

Kodongo et al (2014) based on Kenyan listed firms found the mean for gearing was 57% with a standard deviation of 0.233. Similarly Hove and Chidodo (2012) employing 84 observations from listed companies in Zimbabwe found dissimilar results, where total gearing was at the mean of 23.8% with a standard deviation of 0.2187. Thus, Tanzanian listed firms are in range with other comparable countries in terms of variability and level of gearing. This help to point to the fact that there is no capital structure inertia in Tanzanian firms. This is further supported by the dynamic adjustment evidenced in the dynamic regression models in Table 3; where the speed of adjustment for gearing among these firms was in the range of 0.3185-0.3595 (extracted as follows: $1-\delta=\alpha$; where δ lagged debt coefficient and α is the speed of adjustment for gearing). La Rocca et al, (2009) argue that if the coefficient ($1-\delta$) is close to 1 the adjustment process is slow.If it is close to 0 then adjustment occurs rapidly.

The lagged total debt variable coefficient (L.TGEAR) was in the range of 0.6405-0.6815 and significant at 0.001, for Models 6 to 10, indicating that for a 1 unit increase in prior year's gearing there is a 0.6405 to 0.6815 increase on proceeding years' gearing. According to Moyo et al (2013), this indicates that firms have target leverages towards which they adjust over time. Thus, based on this finding by considering the lowest and the highest alpha values in the models, alpha is in the range 0.3185-0.3595 and below 0.5 and is approaching 0. Based on this finding, it is evident that companies at DSE do not adjust their total debt automatically. Debt also seems to stay at their precious years values.There are high transaction costs associated with increasing total debt. The costs associated with being in disequilibrium are low and thus companies slowly adjust their total debts. Normally, when firms deviate from equilibrium level, they rebalance their capital structure ratios towards the target levels. Principally, the dynamic adaptation of the trade-off theory postulates that adjustment costs

normally prevent firms from continually adjusting their gearing ratios. If firms follow a target optimal level of debt in their capital structure, deviations from the equilibrium level are temporary and therefore the speed of adjustment will be relatively high. On the contrary, if firms do not attribute great importance to their target leverage ratios (or if the transaction costs are high), then an adjustment of capital structure toward the optimal level. For example in response to a shock, will be slow or even non-existent in a given year. Moyo et al (2013) argue that if the speed of adjustment is zero, firms have no leverage targets and therefore do not follow an adjustment process. However, in cases where speed of adjustment is greater than zero, then firms have gearing target levels that they adjust to it.

Table 1: Descriptive Statistics

	Count	Mean	Std	Min	Max
TGEAR	128	0.4690	0.2494	0.1312	1.0884
TANG	128	0.5449	0.1657	0.1953	0.8786
SIZE	128	24.3900	1.6830	20.6496	27.6105
PROF	126	0.2884	0.2329	-0.3206	1.0910
GROP	116	0.1490	0.1979	-0.6870	1.1140
GOCO	128	39.8750	20.4104	1.0000	84.0000
RISK	114	-6799.2433	68998.0390	-736113.1875	10875.3662
NDTS	123	0.0625	0.0530	0.0064	0.3954
N	128				

Thus, companies listed in DSE seem to have target debt levels to which they strive to adjust to it. These firms seem to slowly adjust to their total gearing due to their low adjustment coefficients (α= 0.3185-0.3595). Moyo et al (2013) maintains that, in a perfect market, firms always sustain their target or optimal ratio; but in an imperfect market, firms merely slowly adjust because of information asymmetries, transaction and adjustment costs. This later case seems to fit an explanation for the DSE listed firms. The DSE locally listed

firms case depict the following facts which were corroborated by Moyo et al (2013), that the speeds of target adjustment differ between countries, reflecting the disparity in these factors. Countries such as Tanzania, with low-quality firms, bad legal systems, unfavourable institutional features and unstable, stagnant, or slowly growing economies will exhibit a low speed of adjustment. These characteristics increases adjustment costs and hence hinder faster and more frequent adjustments.

We ran regression models (1-10) (Table 3). The ordinary least squares (OLS) and random effect generalised least squares (RE_GLS) models were initially introduced in the process of identifying the best fitting model for the data. The subsequent fixed effects (FE) models (3-10) (Table 3) indicated better performance. The RMSE was considerably lower for fixed effects models (3-8) RMSE ranging between (0.0806-0.113). The OLS and RE models had RMSE of 0.181 and 0.126 respectively. The more this ratio approaches to zero indicates that the model is performing better in fitting the data. The R^2 were also high for the FE models compared to the OLS and RE. The Hausman test was significant, it guided in choosing the FE over the RE models. The models employed were significant (Table 3).

Tangibility (TANG)significantly and positively relate to gearing as expected in our hypothesis since the more tangible are the assets the more lenders are willing to offer debts. It is evident that firms with large amounts of tangible assets (as also manifested in our panel in Table 1, tangibility is 0.54) already have collateralizable assets that entice them to resort to external financing rather than equity financing. The mean for asset tangibility was at 0.528 (Table1) indicating that more than half of the assets of the companies were properties, plant and equipment. This finding is consistent to most empirical findings that confirm a positive relationship, for instance

Titman &Wessels (1988) and Apostu (2010) in developed countries and Abor (2008), Khediri & Daadaa (2011), Hove & Chidoko (2012), Gweyi et al., (2013) and Umer (2013) in developing countries. Profitability (PROF) statistically significantly and negatively relate to gearing as expected (Table 2). It indicates that firms are trying to obtain financing through internally generated funds (Apostu, 2010). Transaction cost arguments supports this finding, that external finance are expensive compared to internal finance. Theoretically, there are two possibilities, which empirical evidence support them, first if past profitability are a good proxy for future profitability then profitability positively relate to gearing. On the other hand, if firms are capable of generating sufficient profits and following a pecking order financial behaviour, they will resort to internal financing against debt. Thus, profitability negatively relate to gearing.

This is evidenced by the high mean profitability of 28.84% with a max of 109.10% in Table1, evidencing availability of high profits that can be used internally to finance the companies. Corroborative evidences for a negative relationship are extensive from other studies, such as (e.g. Rajan & Zingales, 1995; Booth, et al., 2001; Fama & Frech, 2002; Abor, 2008; Vries, 2010; Khediri & Daadaa, 2011; Hove & Chidoko, 2012; Aremu et al., 2013; Latridis & Zaghmour, 2013; Umer, 2013; Tarus et al., 2014). Size (SIZE) of the firm isstatistically significant and negatively related to gearing (Table 2). The negative relationship is support the evidence based on the idea that large firms may opt not to borrow due to stable profitability, which is used as an internal financing substitute. Thus, it seems, instead of resorting exclusively to debt for financing, firms at DSE are using internal financing more compared to external financing. This is evidenced by low gearing (47%), against equity (53%) (Table 1) coupled by high profitability with the mean of 28.84% with a max of 109.10%.

Table 2: Correlation Analysis

	TGEAR	TANG	SIZE	PROF	GROP	GOCO	RISK	NDTS
TGEAR	1							
TANG	0.484***	1						
SIZE	-0.203*	-0.0570	1					
PROF	-0.596***	-0.397***	0.429***	1				
GROP	0.0266	-0.0217	0.115	0.213*	1			
GOCO	-0.0983	0.154	0.401***	0.229**	-0.0316	1		
RISK	0.0896	-0.00462	0.219*	0.0783	0.0739	0.167	1	
NDTS	0.138	0.0569	-0.156	0.130	-0.0283	0.0610	0.0107	1
N	128							

*p< 0.05, **p< 0.01, ***p< 0.001

The negative relationship is consistent to Achy (2009) who employed a panel of 550 non-listed Moroccan firms, with 2,859 observations. He used natural logarithms of sales, natural logarithms of assets and natural logarithms of employment to measure size for a robust analysis. He observes that all three measures for firm size negatively relate to long-term capital structure ratios. Vries (2010) also found a negative relationship, he particularly unlike other researchers used natural logarithms of sale. He conclude that firms with large amounts of tangible assets already have a stable income that pushes them to resort to internal financing rather than debt financing.

In addition, firm's size is a sign of ability to reduce information asymmetry. Less information asymmetry, attract equity than debt finance for the reason that, public investors are more informed about the firms. Therefore, chances that shares are undervalued are very low, and as such, investors are more willing to buy equity. As a result, such firms, at time may prefer equity relative to borrowing; hence, a negative relationship is justified. Growth opportunities (GROP) positively relates to TGEAR (Table 2). The results were significant (Table 3). The findings were consistent to many other studies in Africa. Africa is largely represented by developing economies. Studies indicated positive relationships of growth

opportunities to gearing (e.g. Doku, et al., 2011; Hove & Chidoko, 2012; Nyamora, 2012; Ogbulu & Emeni, 2012; Bundala & Machogu, 2012; Latridis & Zaghmour, 2013; Gweyi et al., 2013; Nyanamba et al.,2013). The companies in the present study sample have a mean of 14.9% for growth opportunities (Table 1). This high mean indicates that the sample is made of high growth opportunities firms. High growth opportunities firms are characterised by high needs of funds. Therefore, internal financing may not suffice their financing needs as a result they would resort into external financing. These firms are further constrained by "ownership control rights" they want to maintain their ownership. Thus, they would normally resort to external financing. These two reasons seem to partly paint the picture of companies in Tanzania.

Going concern (GOCO) negatively relate to TGEAR (Table 3). Theoretically, age accounts for company reputation. However, the kind of reputation contained in the age of the company will depend on other factors as well. Some companies such as TOL Limited are very old. They are loss-making companies. That would add to bad reputation. On the other hand, other companies such as TBL are old and profit making that would add to good reputation. Thus, a sound going concern positively relate to debt. The mean age in our sample was 39 years (Table 1). This indicates the dominance of experienced companies. However, notably Esperança et al. (2003) found that age negatively relate to both long-term and short-term capital structure ratios. The reasons for this relationship are probably due to bad reputation from most companies witnessed by a negative minimum profitability of -0.3206 (loss) (Table 1) and information asymmetry.

Table 3: Regression Analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Static fixed effect models			Dynamic fixed effect models			GMM models	
	OLS	RE_GLS	LSDV1_b	CSE	PCSE	dLSDV1_b	dCSE	dPCSE	GMM_ab	GMM_bb
L.TGEAR						0.6405***	0.6405***	0.6538***	0.6815***	0.6737***
						(0.08)	(0.08)	(0.07)	(0.05)	(0.04)
TANG	0.2575**	0.1472	-0.0004	-0.0004	0.0396	0.0364	0.0364	0.0313	0.0553	-0.0038
	(0.12)	(0.14)	(0.16)	(0.21)	(0.08)	(0.12)	(0.13)	(0.08)	(0.08)	(0.10)
SIZE	0.0763	0.1670	-0.2594	-0.2594	-0.3337	-0.6126*	-0.6126	-0.608**	-0.5600**	0.0763**
	(0.01)	(0.02)	(0.06)	(0.06)	(0.05)	(0.04)	(0.04)	(0.03)	(0.03)	(0.00)
PROF	-0.579***	-0.397***	-0.1706	-0.1706	-0.249***	-0.355***	-0.3557**	-0.354***	-0.4034**	-0.422***
	(0.09)	(0.09)	(0.11)	(0.12)	(0.05)	(0.08)	(0.11)	(0.07)	(0.14)	(0.11)
GROP	0.1362	0.0787	0.0728	0.0728	0.0867**	0.1279**	0.1279*	0.128***	0.1536***	0.091***
	(0.09)	(0.07)	(0.07)	(0.05)	(0.04)	(0.05)	(0.07)	(0.04)	(0.04)	(0.03)
GOCO	-0.0558	-0.0398	-12.4748	-12.47**	-9.1276**	-5.8027	-5.8027	-5.835**	0.9849**	-0.0707
	(0.00)	(0.00)	(0.13)	(0.05)	(0.04)	(0.09)	(0.03)	(0.03)	(0.00)	(0.00)
RISK	0.1166	-0.0165	-0.0081	-0.0081	-0.0270	-0.0048	-0.0048	-0.0018	-0.0079	-0.0350*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NDTS	0.2277**	0.1208*	0.1616**	0.1616*	0.0935**	0.1552***	0.1552***	0.157***	0.1031***	0.109***
	(0.34)	(0.25)	(0.26)	(0.23)	(0.16)	(0.18)	(0.10)	(0.13)	(0.10)	(0.15)
N	112	112	112	112	112	112	112	112	100	112
R^2	0.508		0.858	0.858	0.798	0.928	0.928	0.933		
R^2 adjusted	0.475		0.798	0.798		0.896	0.896			
RMSE	0.181	0.126	0.113	0.113	0.0944	0.0806	0.0806	0.0807		
MSS	3.536		5.973	5.973	2.744	6.462	6.462	6.981		
RSS	3.425		0.988	0.988	0.695	0.500	0.500	0.501	1.136	1.181
F	15.34***		14.28***	.		29.28***	.			

Standardized beta coefficients $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$

Risk of bankruptcy (RISK) negatively relates to TGEAR, the results were not significant in most models except Model 10 (Table 3). Firms with high debt levels have higher volatility of net profit and implicitly higher bankruptcy risk. Thus, one needs to expect a negative relationship between debt and risk (Booth et al., 2001; Alonso, 2003).Research evidences indicate that firms tend to shy away from excessive debts in order to reduce their bankruptcy risk.

This study's findings are consistent to studies from both developed and developing economies. These studies indicate that bankruptcy risk negatively relate to capital structure ratios (Alonso, 2003; Abor, 2008; Apostu, 2010; Junior & Funchal, 2013; Moyo, 2013; Umer, 2013; Gathogo & Ragui, 2014). The rationalization put forward, which is adopted to support this relationship, is that bankruptcy risks emanate from both increases in direct and indirect financial distress costs. Firms with high profitability and risk averse tend to avoid debt usage by relying on internal financing in order to reduce bankruptcy risk

(Vries, 2010; Abor, 2007). Non-debt tax shield (NDTS) positively relate to total gearing and short-term gearing but negatively related to long term gearing (Table 3). The results were significant for total and short-term gearing. Theoretically, if firms are capable of gaining from non-debt tax shields, they may shy away from debt. Firms that are capable of decreasing taxes by means other than interest deductions such as depreciation will employ less debt in their financing structures. Debt-tax shields unlike non-debt tax shields positively relates to gearing (Umer, 2013). Conversely, one would expect a negative relationship between non-debt tax shield and gearing. This is only consistent for our long-term gearing. Total and short-term gearings indicate the contrary that is firms are not capable of decreasing taxes by other means (such as depreciation) than interest deductions. The positive relationship help to highlight this reverse positive relationship for NDTS in the current study, because in Table 1, the NDTS (calculated as total depreciation and amortization over total assets) are very low at a mean of 0.06.

The findings were consistent to that of Titman and Wessel (1988) and Umer (2013) except for long-term gearing. They found a positive relationship between non-debt tax shields and total gearing in developed economies and Ethiopian companies respectively. We adopt their explanation put forward that non-debt tax shields were not a substitute for total and short-term debt tax shields, except for long-term gearing. The negative relationship implies that for long-term gearing when corporate taxes increases are high, firms, which are able to reduce taxes by means other than deducting interest will employ less debt in their capital structure (Vries, 2010). When non-debt tax shields positively relate to long-term gearing, it means they substitute for debt tax shields (La Rocca et al., 2009).

Recommendations and Conclusion

Capital structure ratios variability points to the fact that firms are trying to adjust their capital structure to reflect the costs and advantages of each financing choice. The speed of adjustment helps to depict the fact that firms are trying to move their capital structures towards optimum ones. The low speed of adjustment of capital structure ratios indicates that the cost of adjustment is rather high among DSE firms. Thus, transaction costs (such as legal, litigation, interests, listing and information) both direct and indirect seem to be high among DSE companies. Prior years' capital structure ratios are closely predicting proceeding years' debt levels. As noted previously firms are cautiously adjusting their debt levels, keeping them in line with prior years' levels. Such capital structure ratios adjust so cautiously towards optimum ones due to the risk eminent from debt usage.

Presence of tangible assets such as plants, property and equipment dictate the ability for a firm to borrow and hence adjust its capital structure both in the short run and in long run. Presence of large amounts of retained profits facilitated by big firm's size and high growth opportunities as supported by the results help firms resort to internal financing. This is evidenced by the negative relationship for size and profitability and positive relationship for growth opportunities to capital structure. Firms are capable of decreasing taxes through means other than interest deductions such as depreciation; as a result, they employ less debt in their financing structures. The reputation of firms at DSE did not account for positive effects on capital structure. This indicates as suggested by other researchers, the presence of information asymmetry at DSE that makes lenders ignore age in screening candidates for debts. Bankruptcy risks emanate from both increases in direct and indirect financial distress costs. Firms with high profitability and risk averse

tend to avoid debt usage by relying on internal financing in order to reduce bankruptcy risk.The large r^2 in the range of 0.798—0.933 and the adjusted r^2 in the range of 0.798—0.896 (Table 3) account for a very large and substantial effects of these factors under study on capital structure ratios. This evidences the importance of these factors during capital structure decisions.

Thus, managements, policy makers, regulators and investors need to account for these factors when making policy, regulating the financial markets, and investing in these listed companies. Due to high transaction costs that are indicative from the dynamic adjustment analysis, it is important that transaction cost resulting from information asymmetry, listing requirements, information flow, legal litigation and interests' obligations be studied and monitored in order to improve transparency and flow of correct and reliable information to investors and lenders. This will help firms easily adjust their capital structure ratios to maximize from their financing choices.The results indicated that capital structures of firms at DSE are varying over time and across companies. The results are generally consistent to theory and other researchers' empirical findings.

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