PARTIAL ADJUSTMENT TOWARD TARGET CAPITAL STRUCTURE: EVIDENCE FROM SELECTED AFRICAN COUNTRIES

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Abstract

This paper investigates the firm-specific determinants of target capital structure and the speed of adjustment towards this target for industrial firms in four African countries. In addition to using a two-stage, dynamic partial adjustment model which sheds light on the dynamic nature of the adjustment process, various definitions of leverage are also used to check for robustness. The findings of the paper indicate that African firms adjust faster to short-term debt targets than they do to long-term debt targets. Furthermore, firms in Nigeria and South Africa adjust relatively faster to their target capital structures, whereas firms in Ghana and Kenya have slower speeds of adjustment, pointing to the existence of higher adjustment costs and less-developed capital markets in these countries. The speeds of adjustment obtained range from 17.9%-60.2% per year, consistent with international evidence regarding speeds of adjustment in other developing and emerging economies.

Keywords: Capital Structure, Industrial Firms, South Africa, Emerging Economies

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1. Introduction

The institutional environment in which African firms operate has two salient features: underdeveloped financial systems characterized by a high degree of informational asymmetry, inefficient and illiquid capital markets (Gwatidzo and Ojah, 2009). It is well established that in order for a country to grow and prosper, certain macro and micro-level factors are needed. On the macro-level, factors such as protection of shareholder's rights, cheap and easy access to debt markets and property rights are required, whilst on the micro-level the role of firms as a source of providing jobs and generating tax revenue for governments is emphasized. Firms in these countries can therefore play a critical role in promoting economic growth, and their success in doing so depends on how effectively they can raise capital to finance their activities. A firm's capital structure can therefore impact its long-run growth prospects and ultimately the growth of the entire economy. A study of the dynamics of a country's capital structure is therefore essential.

Five decades have passed since the publication of Miller and Modigliani (1958)'s seminal paper on "Irrelevance Theory", and the question of how firms should raise capital continues to be the subject of intense debate (see contributions by Rajan and Zingales, 1995; Myers, 2001; Baker and Wurgler, 2002; among others). Irrelevance theory posits that, in perfect capital markets, the choice between debt and equity does not affect firm value. After relaxing some of the assumptions required for perfect capital markets, economists have focused on two main capital structure theories: the pecking order, and the trade-off theories of capital structure.

The trade-off theory, which acknowledges the existence of an optimal capital structure, states that an optimal capital structure is established by balancing the benefits and costs of debt (Kim, 1978; Kraus and Litzenberger, 1973; Jensen and Meckling, 1976; Myers, 1977). Since countries differ markedly in their institutional set-ups and market-structures, firms from different countries are bound to have different determinants of optimal capital structure. This is in line with previous studies by Rajan and Zingales (1995), Wald (1999) and Booth et al (2001) who provide evidence that differences in capital structures can be explained by institutional environments and country heterogeneity. Furthermore, observed capital structures frequently differ from target levels because of adjustment costs. Dynamic trade-off theory of capital structure has found strong support (Leary and Roberts, 2005; Huang and Ritter, 2009).The evidence as to whether firms are quick or slow in adjusting to their optimal capital structure targets, however, remains mixed. Fama and French (2002) estimate a speed of adjustment of 7-18% per year, while Flannery and Rangan (2006) estimate an even faster SOA; 35.5% per year using market leverage and 34.2% per year using book leverage, suggesting that it takes about 3.2 years after a shock for a firm to return to its optimal target. In Frank and Goyal (2007: 185) it is noted that "Corporate leverage is mean-reverting. The speed at which it happens is not a settled issue."

Empirically, tests on the trade-off theory of capital structure are in no short supply. However, most studies tend to be based on cross-section data and orthodox multiple regression analysis (Shah, 2011: 2). The short-comings with these models are that the observed leverage ratio may differ from the optimal ratio predicted by the trade-off theory (Myers and Majluf, 1984). Furthermore, these approaches also do not shed any light as to how leverage adjusts to the target level over time. Until recently, models of dynamic capital structure adjustments were largely ignored.

This paper investigates two important issues related to firm behaviour when raising capital. Firstly, we investigate capital structure determinants in 4 African countries[1]. Secondly, we assess the speed of adjustment (SOA) towards an optimal capital structure. We seek to achieve the above aims by addressing the following questions. Do African countries adjust their capital structure targets in line with the dynamic trade-off theory? Are SOA of firms in African countries similar and are the results robust to different leverage definitions?

The contributions of the paper are threefold. Firstly, there is a dearth of literature on SOA for firms in Africa. African countries have been largely ignored in much of the dynamic capital structure literature. Although studies have looked at the determinants of capital structure in African countries (see for example, Gwatidzo and Ojah, 2009), very few studies explicitly look at the dynamics of capital structure and speed of adjustment using several countries. For example studies by Kyaw (2009), Ramjee and Gwatidzo (2012); and Chipeta, Wolmarans and Vermaak, (2012) investigate capital structure dynamics using South African firms. However, elsewhere in Africa the topic has not received sufficient attention and, to the best of our knowledge, a comparative examination of capital structure SOA on African countries has not been undertaken to date. Secondly, results obtained from dynamic panel models are sensitive to the definitions of leverage used in estimating them. By testing various definitions of leverage, some insights may be gained as to whether different specifications yield robust results, and additionally, whether the results obtained are in line with predictions made by existing capital structure theories. The paper also takes advantage of the benefits that panel data has to offer. According to (Terra, 2002**;** Hsiao, 1986) panel data increases the number of data points, resulting in greater number of degrees of freedom. The GMM model also deals with the possible endogeneity between the regressors and the country-specific effects, as well as yielding consistent and unbiased results for threshold panel models.

[1] The countries are Ghana, Kenya, Nigeria and South Africa.

This paper is organized as follows. Section 2 presents an overview of the capital structure literature. In addition to providing a description of the variables used in the study, Section 3 outlines the methodology used to conduct the study. Section 4 presents the results and Section 5 concludes the paper.

2. Literature Review

There are several theories of capital structure, including the Modigliani and Miller propositions, marketing timing theory, pecking order theory and trade-off theory of capital structure. Since this paper's main focus is on dynamic capital structure our literature review is largely based on the static and dynamic trade-off theories of capital structure. In the following section we briefly look at the two theories of capital structure.

The static trade-off theory **-** In stark contrast to the Irrelevance Theorem, it was found that after taking capital market imperfections into account, the mix between debt and equity does in fact affect firm value. Modigliani and Miller (1963) introduced corporate taxes to their model and their conclusion was that to maximize its value, a firm should have 100% debt. However, 100% debt is hardly feasible and at odds with what is observed in practice. In follow-up studies performed by Modigliani and Miller (1966) and Baxter (1967) it was suggested that firms generally favour debt due to the advantages of tax shields. Using a probit model, Mackie-Mason (1990), found that tax-paying firms favour debt. However, it was also argued that the high costs of financial distress due to excessive debt levels lead firms to use more equity. Value-maximizing firms should therefore choose the level of debt by balancing the benefits and costs associated with debt financing (Berens and Cuny, 1995; Myers, 2003; Bradley, Jarrell and Kim, 1984). This is the essence of the static trade-off theory. Firms strive to reach this optimal point called the "target capital structure". As noted by Drobetz and Wanzenried (2006), the static framework assumes no difference between target capital structures and those actually observed. Since the role of time in these single-period models was ignored and the apparent failure of these static models to explain the financing behaviour of firms, the need to study the dynamics of actual capital structure toward target capital structure became apparent.

Dynamic trade-off theory **-** The failure of the static trade-off theory of capital structure to adequately explain the financing behaviour of firms has seen the emergence of the dynamic trade-off theory. Unlike the static trade-off theory which assumes that actual and target (optimal) debt ratios are identical, dynamic capital structure theory acknowledges that the two are different; random shocks can push firms off the target and firms must move back to the optimal level. The firms also face different adjustment costs when going back to the optimal level such that it may take time for each firm to reach the optimal level again. It must also be noted that the optimal level itself is also changing over time; such that the firm is actually targeting a “moving target”.

Since firms face different adjustment costs and exogenous shocks, firms will have different target capital structures; which are also time-varying. A dynamic theory of capital structure choice in the presence of transaction costs has been formulated by Fischer et al (1989). Other more recent contributions to this strand of literature include; Yeh (2011), Reinhard and Li (2010), Nunkoo and Boateng (2010), Hass and Peters (2006). Hovakimian et al (2001) employed logistic regressions in order to analyze a firm’s choice between debt and equity, and their results indicate that firms do adjust toward an optimal debt ratio. Using a dynamic model of capital structure Ju et al (2002) observe that firms’ actual leverage levels are in line with the trade-off theory. Leary and Roberts (2005) argue that firms are more concerned with excessively high leverage, as opposed to excessively low leverage, and that when rebalancing firms rebalance to a range rather than a specific target. Clark et al (2009) find supporting evidence to the dynamic trade-off theory for 40 countries.

Despite a growing body of literature on dynamic capital structure, there is no consensus regarding the speed of adjustment. Fama and French (2002) find estimates ranging between 7%-18% per year while Huang and Ritter (2009) find average speeds of 17% when using book leverage and 23.2% when using market leverage. Flannery and Rangan (2006) report speeds of 34.2% using book leverage and 35.5% when market leverage is used as the dependent variable. Furthermore, negative speeds of up to -7% have been reported by Iliev and Welch (2010: 10) who argue that managers “amplify the effects of shocks.”

Drobetz and Wanzenried (2006) analyze the impact of various macroeconomic factors on adjustment speeds and find that firms with better growth opportunities and that are further away from target debt ratios, will adjust more quickly. Also, during periods where the term spread on interest rates are high and during economic booms, firms adjust more quickly. This is also in line with Cook and Tang (2008) who find faster adjustment speeds during good economic times. Flannery and Hankins (2007) observe that the speed of adjustment towards the optimal target capital structure depends on the adjustment costs as well as the costs of deviating from the target. Byoun (2008) suggests that one of the determinants of the speed of adjustment is the financial needs of the firm. He argues that firms with a deficit and below-target debt, and firms with a surplus and above target debt will adjust faster than corresponding firms with a deficit but above target debt, and firms with a surplus and below target debt. Higher tax rates and financial market developments are also positively related to the speed of adjustment. Developing nations with stronger creditor and shareholder rights have faster adjustment speeds (Clark et al., 2009).

Most of the existing empirical studies on dynamic capital structure focus mostly on developed countries. For instance, Kremp et al (1999) analyze a large panel of French and German firms and confirm the existence of a dynamic adjustment process. In a study conducted on UK non-financial firms, Ozkan (2001) found that UK firms have a target capital structure to which they quickly adjust. Gaud et al. (2005) analyze the adjustment to target capital structure of Swiss firms and find that the speed of adjustment in Switzerland is much lower than in other countries, pointing to institutional differences. Country-specific factors as well as firm-specific factors are significant determinants of capital structure (De Jong et al, 2008; Demirguc-Kunt & Maksimovic, 1996).

Using a dynamic unrestricted capital structure model, Nivorozhkin (2003) examines the speed of adjustment in transition economies. It was found that Bulgarian firms adjusted much faster than Czech firms, with the speed of adjustment being positively related to the distance between observed and target capital structure for firms in Bulgaria. Maghyereh (2005) uses a dynamic panel model to investigate the dynamics of capital structure for manufacturing firms in Jordan, and finds that Jordanian firms do have target debt ratios and they do adjust to them relatively fast, indicating that adjustment costs and the costs of being away from the target are important. Haas and Peters (2006) investigate capital structure determinants in 10 Central and Eastern European countries during the period 1993-2001 and find an average speed of adjustment ranging between 4-49%. They argue that slow adjustment speeds could be the result of market frictions in these economies.

Khalid (2011) looks at the impact of financial reforms on the dynamics of capital structure of Pakistani firms, and finds that the adjustment process of capital structure in Pakistan is much slower as compared to developed countries. Mahakud and Mukherjee (2011) analyse manufacturing firms in India and conclude that various adjustment costs and benefits determine the speed of adjustment to target capital structure. Analyzing leverage ratios for companies in Brazil, Chile and Mexico, Sobrinho (2010) finds that capital structure dynamics vary by country and local idiosyncrasies. Using a GMM estimation technique, Ramjee and Gwatidzo (2012) analyze 178 South African listed firms for the period 1998-2008 and find that a target capital structure ratio does exist and that South African firms adjust relatively quickly to this target.

Having highlighted the evolutionary approach of the dynamic trade-off theory, it is evident that the existing body of literature yields mixed results with regards to the determinants of capital structure as well as the speed of adjustment. Proceeding further, an empirical analysis will be undertaken in order to establish whether the findings above will hold in an African context. The next section will present the model and procedures to be used in the econometric analysis.

3. Methodology, data and descriptive statistics

In assessing the dynamic nature of optimal capital structure, a partial adjustment model will be used, adopting the approach of Ozkan (2001) and others. Ariff et al (2008) contend that firms target an optimal leverage ratio which depends on various firm-specific factors. The general model can be expressed as follows:

$$L_{it}^{*} = \alpha_o + \sum_{j}^{J} \alpha_j x_{jit} + u_i + u_t + \varepsilon_{it} \quad (1)$$

Where; L_{it}^{*} is the target leverage ratio of firm *i* at time *t*, X_{jit} stands for firm-specific factor *j* for firm *i* at time *t*; u_i is an unobservable firm-specific; u_t is a time-specific firm-invariant effect, and ε_{it} is a white noise disturbance term.

Due to transaction costs and the time-varying nature of optimal capital structure, firms do not adjust their target levels instantaneously, but rather adjust partially (Hovakimian et al., 2001; Shyam-Sunder & Myers, 1999). This is shown below:

$$L_{it} - L_{it-1} = \lambda_i (L_{it}^{*} - L_{it-1}) \quad (2)$$

Where, λ_i represents the speed of adjustment. If $\lambda_i = 1$ then $L_{it} = L_{it}^{*}$, implying instantaneous adjustment occurs as there are no transaction costs. However, when $\lambda_i = 0$, adjustment to the target does not take place at all. When $\lambda_i < 1$, firms adjust slowly to the target (under-adjust) and if $\lambda_i > 1$, firms over-adjust the debt level above the target leverage and adjust quickly.

Equation 2 can be written as:

$$L_{it} = (1 - \lambda_i) L_{it-1} + \lambda_i L_{it}^{*} \quad (3)$$

Substituting (1) into (3) yields:

$$L_{it} = (1 - \lambda_i) L_{it-1} + \lambda_i \alpha_0 + \sum_{j=1}^{J} \lambda_i \alpha_j X_{jit} + u_i + u_t + \varepsilon_{it} \quad (4)$$

Letting $\phi_0 = (1 - \lambda_i)$ and $\gamma_j = \lambda_i \alpha_j$ for *j = 0,….,J*; yields;

$$L_{it} = \phi_0 L_{it-1} + \gamma_0 + \sum_{j=1}^{J} \gamma_j X_{jit} + u_i + u_t + \varepsilon_{it} \quad (5)$$

Where $1 - \phi_0$ represents the speed of adjustment. We therefore seek to estimate equation (5).

3.1. Estimation Procedure

Numerous econometric procedures have been used to analyze the dynamics of capital structure; however, results from these procedures have generally not been robust (Frank and Goyal, 2007). For instance, possible correlation of the error term with the lagged dependent variable in Equation 5 may produce inconsistent estimates in fixed and random effects models. Also, OLS estimates yield biased results due to fixed effects being ignored. A further complication faced in studies of capital structure is the problem of endogeneity (see for example, Parsons and Titman, 2007; and Getzmann, Lang and Spremann, 2010). To overcome the endogeneity problem, Anderson and Hsiao (1982) suggest the use of an Instrumental Variables (IV) technique in which two-period lagged dependent variables are used as instruments.

However, this procedure does not account for the differenced structure of the error term and may provide results which are not efficient as noted by Antoniou et al (2008).

Arellano and Bond (1991) propose the use of a Generalized Method of Moments (GMM) estimator which uses both lagged values of all endogenous regressors and lagged and current values of all strictly exogenous regressors as instruments. These models can be estimated in two ways: utilizing the levels or the first differences of the variables. For the first differences method, in order to satisfy the condition of the GMM estimator, one has to ensure that there is no second-order serial correlation in the first differences of the error term. Furthermore, the validity of the instruments for GMM can be verified using the Sargan test. However, Blundell and Bond (1998) contend that when the series is close to a random walk, lagged levels of variables are likely to be weak instruments for current differenced variables, leading to GMM estimates which are both biased and inefficient. They suggest the use of a system-GMM which combines the difference and level equations. This system-GMM provides more efficient and consistent results than the difference estimator, provided there is no significant correlation between the fixed effects and the regressors. Deesomsak et al (2009) demonstrate that system-GMM is the most appropriate method in the estimation of dynamic panel data models. Additionally these GMM estimates are more efficient as they are robust to heteroskedasticity. In order to analyze the dynamic nature of capital structure, this paper will utilize the two-step system-GMM procedure using the Arellano-Bover/Blundell-Bond GMM regression.

GMM estimates will only be reliable provided that the instruments used are valid, as well as if there is no serial correlation in the error terms. To ensure parameter consistency we conducted tests for first-order and second-order autocorrelation (AR tests) as well as the Sargan test for over-identifying restrictions. Consistency of GMM estimates requires the absence of second-order auto-correlation. As the Arellano-Bover method relies on first-order differencing, first-order autocorrelation is to be expected and is uninformative according to Roodman (2006). The first-order and second-order tests are denoted by AR(1) and AR(2) respectively. The null hypothesis for both tests states that there is no serial correlation in the error terms. The validity of the instruments can be determined using the Sargan test, whose null hypothesis is that the over-identifying restrictions in the model are valid. If the null hypothesis is rejected, this would be a cause for concern.

3.2 Definitions of Leverage

Various definitions of leverage have been used in the existing literature on capital structure. As noted by Drobetz and Wanzenried (2006) the broadest definition of leverage is the ratio of total (non-equity) liabilities to total assets (denoted by LVTD). This measure can be viewed as proxy for what accrues to shareholders in the event of liquidation. However, this definition has a number of flaws as it is potentially affected by provisions and reserves such as pension fund liabilities, in addition to including items which do not affect financing activities such as accounts payable. The authors offer an alternative definition defined as the ratio of total debt to total capital (LVDC), where capital is the sum of total debt plus equity. As this measure is a function of the capital employed it, therefore, best represents the effects of past financing decisions. The definition of leverage could also be affected by country-specific and certain macroeconomic factors. For instance, Shleifer and Vishny (1992) conclude that a firm's debt capacity is subject to current economic conditions. Booth et al. (2001) observe that firms in developing countries make more use of shorter-term debt. Gwatidzo (2008) further notes that debt in most African firms' capital structure is predominantly short-term debt. Additionally, Halling et al (2011) maintain that firms may opt for debt with shorter maturities when confronted with informational asymmetries. However, they also assert that firms would be expected to have more long-term debt in their capital structures during periods of recessions, if transactions costs associated with rolling over short-term debt are higher. Thus a study of both the long-term and short-term ratios as a measure of leverage would be useful, especially in an African context.

A further issue of contention regarding the definition of leverage is whether to use book or market values. Despite not being readily available, market values provide an accurate measure of the real value of a firm (Banerjee, Heshmati & Wihlborg, 2000). However, Hovakimian et al. (2001) find that the choice between book and market value does not influence results significantly. Therefore, this paper will make use of book values of leverage for the sample countries. This study uses four definitions of leverage, outlined in Table 1, in order to compare and contrast speed of adjustment estimates using the various definitions, in addition to providing valuable information regarding each country's preferences for different types of debt structures.

3.3 The determinants of capital structure

The empirical literature suggests a number of factors that may influence the financial structure of companies. Bradley et al (1984), analyze various firm-characteristic determinants of leverage including earnings volatility, non-debt tax shields, research and development and advertising costs. Titman and Wessels (1988) examine additional determinants including size, profitability and uniqueness. They find that these determinants significantly affect capital structure choices. Rajan and Zingales (1995) document that the primary determinants of capital structure in major industrialized countries are size, profitability, market-to-book ratios and tangibility. Flannery and Rangan (2006) as well as Frank and Goyal (2007) observe that median industry debt ratios play an important role in determination capital structure. In this study it is posited that optimal capital structure is a function of various firm-specific variables. The firm-specific determinants include; profitability, asset tangibility, firm size, growth opportunities, and earnings volatility. Table 1 shows the variables and how they are defined.

Profitability: Empirical evidence provided by Rajan and Zingales (1995), amongst others, point to an inverse relationship between debt and profitability. This is in line with the pecking-order theory which states that firms rely on internal financing before resorting to debt and equity. However, Drobetz and Wazenried (2006) note that there could be a direct relationship between debt and profitability in line with the trade-off theory, as more profitable firms have greater earnings and less bankruptcy costs. The ratio of EBIT (earnings before interest and tax) to total assets is used as a measurement of profitability.

Asset Tangibility: Banks and other providers of capital usually require some form of collateral when issuing loans. Tangible assets are the most common source of collateral for businesses, as they are less subject to informational asymmetries and can reduce the risk of moral hazard. As a consequence, firms with little tangible assets have a hard time raising funds using debt financing, whereas firms with more tangible assets will issue more debt (Jensen and Meckling, 1976; Myers, 1977).

Firm Size: Warner (1977) and Ang et al (1982) point to a positive relationship between firm size and debt, in accordance with the trade-off theory, reasoning that large firms carry more debt, as bankruptcy costs tend to decline as firms get larger. Titman and Wessels (1988) find that larger firms tend to be more diversified than smaller ones, and therefore less likely to fail as they have more stable cash flows. Due to lower informational asymmetry costs associated with asset substitutions, larger firms may take on higher levels of debt. We expect a positive relationship between firm size and leverage.

Growth Opportunities: In the event of bankruptcy, the value of growth opportunities will be close to zero, therefore companies with growth opportunities will limit their use of debt. Rajan and Zingales (1995) find a negative relationship between growth opportunities and leverage. This could be due to the fact that firms issue more equity when stock prices are high. However, in line with the trade-off theory, firms with more growth opportunities will use more leverage as their financing needs might exceed their retained earnings.

Earnings Volatility: In the event of poor earnings or financial difficulty, firms financed by equity can choose not to issue dividends. However, firms with debt are contractually bound to make payments to creditors. As a result, firms that have volatile earnings may limit their use of debt to avoid the high costs of financial distress. We therefore expect a negative relationship between earnings volatility and leverage.

Table 1. Definitions of firm-specific variables used in the study

Variable	**Definition**
Dependent Variables	
Total Debt Ratio (LVTD)	Total Debt to Total Assets
Total Debt to Capital (LVDC)	Total Debt to Total Debt plus Equity
Long-term Debt (LVLD)	Long-term Debt to Total Assets
Short-term Debt (LVSD)	Short-term Debt to Total Assets
Independent Variables	
Profitability (PROF)	Earnings before interest and taxes divided by total assets
Asset Tangibility (TAN)	Fixed assets divided by total assets
Firm Size (SIZE)	Natural logarithm of total assets[2]
Growth Opportunities (GROWTH)	Percentage change in total assets
Earnings Volatility (VOL)	Percentage change in EBIT

[2] Total assets were converted to real values using 2000 prices.

3.4 Data

The sample consists of publicly-listed industrial firms in Ghana, Kenya, Nigeria and South Africa for the period 2001-2011. Financial firms and utilities were excluded as they usually face strict capital structure requirements (Abor and Biekpe, 2007). The choice of countries was based on stock and bond market developments. Data was obtained from the OSIRIS database, which contains firm-level data extracted from annually published financial statements. To minimize the impact of outliers, all variables were winsorized at the 1st and 99th percentiles. All tests and variables were estimated using the Stata 12 package. Table 2 shows the firms used in the study.

Table 2. Number of companies used in sample by stock exchange

Country	Stock Exchange	Number of industrial companies (excluding utilities)
Ghana	Ghana Stock Exchange	20
Kenya	Nairobi Stock Exchange	40
Nigeria	Nigeria Stock Exchange	112
South Africa	Johannesburg Stock Exchange Limited	314
Total		486

Table 3 presents summary statistics for the variables used in the study. Total debt as a percent of total assets, on average, varies from 52.4%in South Africa to 63.1% in Nigeria, indicating that Nigerian firms are highly levered. Kenyan firms, on average have the lowest long-term debt ratios compared to all sample countries. The average size of the firm, which is approximated by the natural logarithm of total assets, is highest in South Africa and smallest in Ghana. Profitability, which is proxied by the return on assets, has a mean of 11.3% in Kenya, the highest return on average from all countries in the sample. On average, firms in Ghana experience the greatest volatility of earnings, while Kenyan firms have the highest proportion of fixed to total assets. Figure 1 also shows the evolution of the various debt ratios over the sample period. All measures of leverage have seen an upward trend in Nigeria and South Africa, the leverage ratios have been relatively constant in Kenya and the use of short-term debt has decreased significantly in Ghana. This could be due to the high interest rates faced by Ghanaian firms and the development of the capital markets which could be encouraging firms to use long-term debt.

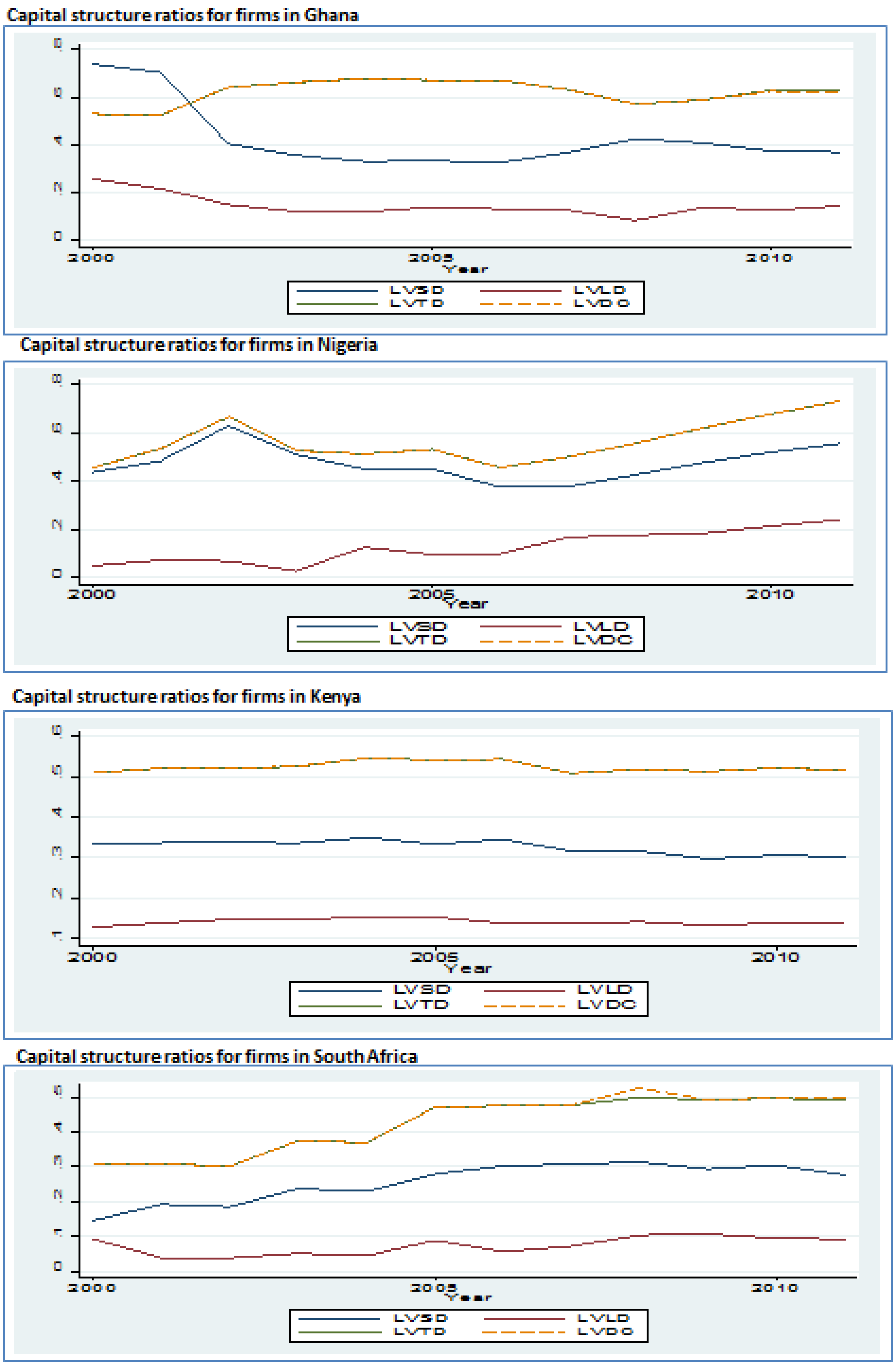
Table 3. Summary Statistics

Country	Variable	Number of Observations	ean	Standard Deviation	in	ax
Ghana	LVSD	144	.468	0.277	.063	.888
	LVLD	80	.165	0.253	.000	.747
	LVTD	144	.583	0.327	.063	.914
	LVDC	144	.583	0.327	.063	.914
	PROF	145	.093	0.157	-0.607	.381
	TANG	145	.492	0.203	.073	.855
	SIZE	145	.701	1.842	.288	4.46
	GROWTH	116	.131	0.336	-0.554	.555
	VOL	116	.241	2.156	-5.771	0.518
Kenya	LVSD	305	.281	0.188	.000	.748
	LVLD	305	.081	0.146	.000	.734
	LVTD	305	.460	0.221	.008	.810
	LVDC	305	.464	0.229	.008	.850

	PROF	281	.113	0.105	0.269	.347
	TANG	305	.544	0.259	0.450	.969
	SIZE	305	0.702	1.621	.718	4.029
	GROWTH	264	.152	0.301	0.497	.446
	VOL	242	.033	2.760	16.071	2.765
Nigeria	LVSD	932	.409	0.372	1.500	.750
	LVLD	306	.134	0.150	.000	.481
	LVTD	876	.631	0.364	.029	.957
	LVDC	885	.630	0.364	.029	.957
	PROF	781	.088	0.162	0.665	.588
	TANG	932	.537	0.354	.004	.544
	SIZE	926	0.194	1.887	.991	3.924
	GROWTH	791	.378	1.102	0.866	.074
	VOL	637	0.145	2.257	10.485	.913
South Africa	LVSD	2885	.324	0.216	.005	.787
	LVLD	2389	.142	0.181	.000	.681
	LVTD	2908	.524	0.254	.020	.743
	LVDC	2908	.524	0.254	.020	.724
	PROF	2839	.077	0.221	1.264	.584
	TANG	2908	.524	0.269	.001	.995
	SIZE	2908	1.694	2.165	.275	6.043
	GROWTH	2564	.378	1.438	0.735	2.021
	VOL	2466	.016	3.385	18.197	7.086

Notes: The sample includes all listed firms (excluding financials and utilities). LVTD stands for total debt ratio, LVDC total debt to capital ratio, LVLD stands for long term debt ratio, LVSD stands for short term debt ratio. PROF is calculated as EBIT (earnings before interest and taxes) divided by total assets. TANG is fixed assets divided by total assets. Size is the natural logarithm of total assets. GROWTH is the percentage change in total assets and VOL is the percentage change in EBIT. Book values of total assets have been used.

Figure 1. Mean Leverage Ratios over time



Notes: LVTD stands for total debt ratio, LVDC total debt to capital ratio, LVLD stands for long term debt ratio, LVSD stands for short term debt ratio.

4. Results and analysis

Table 4. Speed of adjustment in sample countries using different definitions of leverage

Country	LVSD	LVLD	LVTD	LVDC
Ghana	50.70%	17.90%	29.40%	29.50%
Kenya	43.33%	27.50%	24.10%	34.10%
Nigeria	46.40%	60.20%	46.30%	46.20%
South Africa	53.80%	53%	42.80%	42.80%

Table 5. Determinants of capital structure for the sample countries

Panel A: Ghana

	1	2	3	4
Explanatory Variable	**LVSD**	**LVLD**	**LVTD**	**LVDC**
Lev_{t-1}	0.567***	0.725***	0.759***	0.659***
	(0.011)	(0.010)	(0.043)	(0.058)
Profitability	-0.212***	-0.310***	-0.406***	-0.384***
	(0.030)	(0.027)	(0.109)	(0.065)
Asset Tangibility	-0.230***	-0.055***	-0.164**	-0.139***
	(0.021)	(0.012)	(0.066)	(0.048)
Size	0.004	0.003	0.005	-0.007
	(0.003)	(0.005)	(0.009)	(0.01)
Growth	0.083***	0.021***	0.098***	0.112***
	(0.017)	(0.007)	(0.017)	(0.011)
Volatility	-0.003**	0.001	-0.002	-0.002***
	(0.001)	(0.000)	(0.002)	(0.001)
Constant	0.223***	0.053	0.182*	0.351***
	(0.033)	(0.055)	(0.110)	(0.111)
AR (1)	-3.634***	-2.710***	-3.358***	-3.235***
AR (2)	1.609	0.463	1.462	0.577
Wald (df)	14349.56 (6)***	17694.98 (6) ***	27991.60 (6)***	27991.60 (6)***
Sargan (df)	33.393 (232)	35.043 (232)	33.913 (232)	34.627 (232)

Panel B: Kenya

	1	2	3	4
Explanatory Variable	**LVSD**	**LVLD**	**LVTD**	**LVDC**
Lev_{t-1}	0.493**	0.821***	0.706***	0.705***
	(0.243)	(0.244)	(0.239)	(0.239)
Profitability	0.287	0.087	-0.227	-0.227
	(0.397)	(0.315)	(0.142)	(0.141)
Asset Tangibility	-0.294**	-0.019	-0.338	-0.338
	(0.138)	(0.279)	(0.182)	(-0.182)
Size	-0.048	0.019	0.028	0.028
	(0.033)	(0.0397)	(0.044)	(0.044)
Growth	-0.105	0.054	-0.125***	-0.125***
	(0.054)	(0.064)	(0.033)	(0.033)
Volatility	-0.004	-0.02	0.002	0.002
	(0.008)	(0.018)	(0.003)	(0.003)
Constant	0.835**	-0.154	0.113	0.113
	(0.413)	(0.4000)	(0.382)	(0.383)
AR (1)	-1.841*	-1.722*	-1.403	-1.402
AR (2)	-0.482	-1.103	-0.305	-0.303
Wald (df)	1321.72 (6)***	2355.80 (6)***	416.42 (6)***	418.39 (6)***
Sargan (df)	13.853 (128)	7.843 (69)	15.196 (128)	15.189 (128)

Panel C: Nigeria

	1	2	3	4
Explanatory Variable	LVSD	LVLD	LVTD	LVDC
Lev_{t-1}	0.536***	0.398***	0.537***	0.538***
	(0.004)	(0.0187)	(0.0046)	(0.0043)
Profitability	0.508***	-0.327***	-0.405***	-0.407***
	(0.0198)	(0.0264)	(0.0167)	(0.0154)
Asset Tangibility	0.060***	0.039**	-0.009	-0.007
	(0.012)	(0.0152)	(0.0121)	(0.0119)
Size	0.015***	-0.006**	-0.028***	-0.028***
	(0.0024)	(0.003)	(0.0017)	(0.0017)
Growth	-0.009***	-0.026***	-0.008***	-0.008***
	(0.0029)	(0.0025)	(0.0017)	(0.0014)
Volatility	-0.010***	0.001	0.007***	0.007***
	(0.0008)	(0.0006)	(0.0007)	(0.0007)
Constant	-0.055**	0.159***	0.631***	0.627***
	(0.0214)	(0.0359)	(0.0135)	(0.0137)
AR (1)	-3.9387***	-2.1619**	-3.6459***	-3.6548***
AR (2)	-0.48377	-2.5529**	-0.39749	-0.39699
Wald (df)	246525.84 (6)***	3921.77 (6)***	143058.05 (6)***	146088.47 (6)***
Sargan (df)	92.022 (345)	47.024 (179)	91.177 (345)	90.753 (345)

Panel D: South Africa

Explanatory Variable	1 LVSD	2 LVLD	3 LVTD	4 LVDC
Lev_{t-1}	0.462***	0.470***	0.572***	0.572***
	(0.001)	(0.001)	(0.001)	(0.001)
Profitability	-0.109***	-0.031***	-0.159***	-0.159***
	(0.001)	(0.000)	(0.001)	(0.001)
Asset Tangibility	-0.104***	0.110***	0.057***	0.057***
	(0.001)	(0.001)	(0.001)	(0.001)
Size	-0.009***	-0.012***	-0.004***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Growth	-0.018***	-0.019***	-0.028***	-0.028***
	(0.000)	(0.000)	(0.000)	(0.000)
Volatility	0.003***	-0.003***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.342***	0.173***	0.259***	0.260***
	(0.001)	(0.002)	(0.002)	(0.002)
AR (1)	-5.800***	-5.700***	-5.862***	-5.858***
AR (2)	0.378	0.008	0.325	0.327
Wald (df)	1.45e+06 (6)***	1.20e+06 (6)***	2.00e+06 (6)***	2.01e+06 (6)***
Sargan (df)	297.672 (362)	271.315 (362)	300.326 (362)	300.260 (362)

Notes: ***, **, and * stand for 1%, 5% and 10% levels of significance, respectively. LVTD stands for total debt ratio, LVDC total debt to capital ratio, LVLD stands for long term debt ratio, LVSD stands for short term debt ratio. $Lev_{t-1}$is defined as lagged leverage ratios. Profitability is defined as the ratio of EBIT to totalassets. Asset tangibility is defined as the ratio of fixed assets to total assets. Size is the natural logarithm of total assets. Growth is the percentage change in total assets and Volatility is measured as the percentage change in EBIT. Leverage measurements are calculated using book values. The estimation period is 2000-2011 and standard errors are reported in parentheses.

Table 5 summarizes the two-step GMM estimation results obtained for each country. All four measures of leverage were used in order to check for robustness. The Wald test for joint significance is satisfied for all countries at the 1% level of significance. Furthermore, the validity of the instruments in all countries is confirmed by the Sargan test. For all sample countries, the AR(1) test statistic reveals the existence of negative first-order autocorrelation, which is normal and expected. The AR(2) test-statistic indicates that there is no second-order autocorrelation for all countries, with the exception of Nigeria when LVLD is used as the dependent variable.

Table 4 provides a range of the speed of adjustment estimates for each country based on the different definitions of leverage. The speed of adjustment is given by 1 minus the lagged leverage coefficient, or $1-\phi_0$. From the results obtained it is clear that speed of adjustment towards optimal capital structure varies from country to country, and that the speed is also sensitive to the definition of leverage used. For example, in South Africa adjustment rates vary from 42.8% using LVDC to 53.8% when LVSD is used as the dependent variable. That is, on average, 48.1% of the difference between optimal (desired) leverage and actual leverage is covered within one year. In other words, after a shock that moves a firms away from the optimal capital structure, it takes an average firm 2.08 years to fully cover the leverage gap, provided that this speed of adjustment is maintained.

The relatively faster rates of adjustment in South Africa and Ghana suggest that firms in these countries face lower adjustment costs than firms in many developed countries. For instance, Shyam-Sunder and Myers (1999) find a rate of adjustment of 0.41 for USA and Kremp et al. (1999) a value of 0.47 for Germany. A rate of adjustment of 0.57 for UK firms was reported by Ozkan (2001). Kenya and Ghana have much slower rates of adjustment, suggesting that firms in these countries face much higher adjustment costs. In a study conducted on capital structure of Spanish firms, De Miguel and Pindado (2001) find a speed of adjustment of 0.2095. They argue that this relatively low speed of adjustment could be attributed to the less developed bond market in Spain, resulting in Spanish firms relying on private rather than public sources of financing. This could also explain the slower speeds of adjustment in Kenya and Ghana. Gwatidzo (2008) notes that bond markets, which are a major source of long-term debt in most developed economies, are still in their infancy in terms of development and are basically dominated by government issues in most African economies. Market frictions, lack of investor protection and corporate bureaucracy in these countries could also explain the slower speeds of adjustments observed.

The estimates of speed of adjustment obtained from the first definition of leverage indicate that firms in all countries adjust much faster to target short-term debt ratios than to target long-term debt ratios. This indicates lower adjustment costs are faced when adjusting to short-term target debt ratios. Given the greater availability of shorter –term debt in African countries, this is not surprising and could explain the increased speed of adjustment for short-term debt. Firms adjust relatively slowly when the long-term definition of leverage is used, pointing to the high adjustment costs associated with long-term debt. Adjustment speeds when the LVTD and LVDC definitions are used are very similar and range from 29.5% to 46.2%.

When it comes to the determinants firm-specific determinants of leverage, the results are largely in line with the theoretic expectations. As shown in Table 5, profitability is negatively related to leverage in Kenya, Nigeria and South Africa, for most definitions of leverage. This negative relationship is in line with the pecking order theory which states that more profitable firms tend to rely on retained earnings as a source of financing before resorting to debt, confirming studies by Titman and Wessels (1988), Rajan and Zingales (1995) and Gwatidzo and Ojah (2009). Profitability has a positive relationship with leverage for firms in Ghana, however, these results are not statistically significant. Tangibility is positively related to leverage in South Africa for all definitions except LVSD, and these results are statistically significant. This is in accordance with Jensen and Meckling's (1976) version of trade-off theory which argues that large firms have more collateral and thus will take on more debt. However, tangibility is negatively related to leverage in Ghana and Kenya, suggesting that monitoring costs for highly levered firms in these countries are quite high leading to less-levered firms taking on more debt as posited by Titman and Wessels (1988). This negative relationship makes sense considering that debt markets in these countries are much less developed resulting in higher monitoring costs.

Size is negatively related to leverage in South Africa at the 1 percent level of significances for all definitions of leverage, in accordance with the predictions of Rajan and Zingales (1995). This is due to larger firms having easier access to equity markets and they would therefore be less reliant on debt. A negative relationship between volatility and leverage is found in Kenya as firms with more volatile earnings face a higher cost of debt. This is in accordance with findings by Bradley et al. (1984). A positive relationship between leverage and volatility is found for South Africa. This is consistent to results found by Ramjee and Gwatidzo (2012).

Finally, firms in Kenya exhibit a positive relationship between growth and leverage, suggesting that firms with growth opportunities prefer to issue debt rather than equity in the event of insufficient retained earnings, in accordance with the pecking-order theory. A negative relationship between growth and leverage in Ghana, Nigeria and South Africa is observed and is highly statistically significant for all the definitions of leverage, confirming findings by Titman and Wessels (1988) and Barclay, Smith and Watts (1995). The reason for the negative relationship can be explained by the greater costs of debt faced by high-growth firms as a result of their risky investment opportunities.

Conclusion

This study set out to examine the speed of adjustment of African firms to their target capital structures. Additionally, it examined how the speed of adjustment estimates differed based on the definitions of leverage used. Empirical analyses were conducted using an unbalanced panel for industrial companies in four African countries. Results were obtained using a dynamic adjustment model utilizing the Arellano-Bover two-step GMM estimation technique. Most of the results obtained were statistically significant and indicated that African firms do have optimal debt-equity ratios, however the speed at which they adjusted differed from country to country as well as on the specification of leverage. Speeds of adjustment ranging from 17.9%-60.2% were observed.

It was found that Ghanaian and Kenyan firms generally bear greater transaction costs when adjusting to target leverage ratios than firms in Nigeria and South Africa. This could be due to differences in the levels of development of bond markets in these countries. Firms in all countries also adjusted relatively quickly to short-term target debt ratios. The speed of adjustment toward optimal long-term debt ratios were much slower indicating the presence of significant adjustment costs in the use of longer term leverage. One of the policy implications emanating from this study is that governments and financial institutions in African countries need to create environments conducive for the further development of bond markets in order to make long-term borrowing cheaper and more accessible. The results also indicate that South African firms also adjust relatively fast to their optimal ratios consistent with findings by Ramjee and Gwatidzo (2012). Lastly, findings from this study indicate that there is a hierarchy when it comes to financing choices in the sample countries. Firms in Africa prefer to use internal funds over external funds, in accordance with pecking order theory. However, this could also be due to restrictive covenants, governance and higher costs associated with long-term debt financing in these countries.

One of the limitations of this study is that due to lack quarterly data, annual data was used. Annual data is usually smoothed and may not pick up significant changes in leverage that would have been possible to identify using quarterly or monthly data. Additionally, only listed firms were included in the study resulting in survivorship bias. Firms are not separated by sector, and the speed of adjustment may be affected by the sector a firm operates in. Also the results from this study need to be interpreted with caution due to the many rigidities these economies face as well as the limited nature of the information published by listed companies.

In conclusion, the capital structure debate is far from over. A number of issues not addressed in this paper need to be investigated and more research on firms in Africa will need to be conducted. This paper investigates firm-specific determinants of optimal capital structure, however, since business owners rely on both firm-specific and market conditions when making capital structure decisions, it would make sense to observe how certain macro-economic factors such as real GDP, term-spreads on interest rates and CPI affect the speeds of adjustment. Also, the dynamics of capital structure for African firms could be examined in industry-specific situations, as well as during various phases of the business cycle. Lastly, future studies could examine the relationship between speeds of adjustment in relation to distance from optimal target structures.

References

1. Abor, J., & Biekpe, N. (2007). How do we explain the capital structures of SMEs in sub-Saharan Africa? Evidence from Ghana. *Journal of Economic Studies, 36*(1), 83-97.
2. Aktham, M. (2005). Dynamic capital structure: Evidence from the small developing country of Jordan. *IIUM Journal of Economics and Management, 13*(1), 1-32.
3. Anderson, T., & Hsiao, C. (1982). Formulation and Estimation of Dynamic Models Using Panel Data. *Journal of Econometrics, 18*, 47-82.
4. Ang, J., Chua, J., & McConnell, J. (1982). The Administrative Costs of Coporate Bankruptcy: A note. *Journal of Finance*(37), 219-226.
5. Antoniou, A., Guney, Y., & Paudyal., K. (2008). The determinants of capital structure: capital market-oriented versus bank-oriented institutions. *Journal of Financial and Quantitative Analysis, 43*(1), 59-92.
6. Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies, 2*(58), 277-97.
7. Ariff, M., Shamsher, M., & Taufiq, H. (2008). *How capital structure adjusts dynamically during financial crises.* Retrieved May 13, 2012, from http://epublications.bond.edu.au/cgi/.
8. Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance, 57*, 1-30.
9. Banerjee, S., Heshmati, A., & Wihlborg, C. (2000). *The dynamics of capital structure.* SSE/EFI Working Paper Series in Economics and Finance No. 333.
10. Barclay, M., Smith, C., & Watts, R. (1995). The Determinants of Corporate Leverage and Dividend Policies. *Journal of Applied Corporate Finance, 7*, 4-19.
11. Baxter, N. D. (1967). Leverage, risk of ruin and the cost of capital. *Journal of Finance*(22), 395-403.
12. Berens, J. L., & Cuny, C. J. (1995). The capital structure puzzle revisited. *Review of Financial Studies*(8), 1185-1208.
13. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143.
14. Booth, L., Aivazian, V., D.-K. A., & Maksimovic, V. (2001). Capital structure in developing countries. *The Journal of Finance*(56), 87-130.
15. Bradley, M., Jarell, G. A., & Kim, E. H. (1984). On the existence of an optimal capital structure: theory and evidence. *The Journal of Finance*(39), 857-878.
16. Byoun, S. (2008). How and when do firms adjust their capital structures towards targets? *Journal of Finance, 63*(6), 3069-3096.
17. Chang, X., & Dasgupta, S. (2009). Target behaviour and financing: how conclusive is the evidence? *Journal of Finance, 64*(4), 1767-1796.
18. Chen, L., & Zhao, X. (2007). Mechanical mean reversion of leverage ratios. *Economic Letters, 95*(2), 223-229.
19. Chipeta, C., Wolmarans, H., & Vermaak, F. (2012). Financial liberalisation and the dynamics of firm leverage in a transitional economy: evidence from South Africa. *South African Journal of Economic & Management Sciences, 15*(2), 171-189.
20. Chui, A., Lloyd, A., & Kwok, C. (2002). The determination of capital structure: is national culture a missing piece to the puzzle? *Journal of International Business Studies, 33*(1), 99-127.
21. Clark, B., Francis, B., & Iftekha, H. (2009). Do firms adjust toward target capital structures? Some International Evidence. *Working Paper*.
22. Cook, D., & Tang, T. (2008). *Macroeconomic conditions and capital structure adjustment speed.* Retrieved from SSRN: http://ssrn.com/abstract=1101664.
23. Dang, V., Garrett, I., & Nguyen, C. (2011). Asymmetric partial adjustment towards target leverage: International evidences. *Asian FMA 2011*.
24. De Jong, A., Kabir, R., & Nguyen, T. (2008). Capital structure around the world: the roles of firm-and country-specific determinants. *Journal of Banking and Finance, 32*(9), 1954-1969.
25. De Matos, J. A. (2001). *Theoretical Foundations of Corporate Finance.* New Jersey: Princeton University Press.
26. De Miguel, A., & Pindado, J. (2001). Determinants of capital structure: new evidence from Spanish panel data. *Journal of Corporate Finance, 7*(1), 77-99.
27. Deesomsak, R., Paudyal, K., & Pescetto, G. (2009). Debt maturity structure and the 1997 Asian financial crisis. *Journal of Multinational Financial Management, 19*(1), 26-42.
28. Demirguc-Kunt, A., & Maksimovic, V. (1996). Institutions, financial markets and firm debt maturity. *SSRN eLibrary*.
29. Donaldson, G. (1961). *Corporate Debt Capacity: A Study of Corporate Debt Policy and the Determination of Corporate Debt Capacity.* Cambridge, MA: Harvard University.
30. Drobetz, W., & Wanzenried, G. (2006). What determines the speed of adjustment to the target capital structure? *Applied Financial Economics*(16), 941-958.
31. Fama, E., & French, K. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies.*15(1), 1-33.
32. Fan, P., Titman, S., & Twite, G. (2008). An international comparison of capital structure and debt maturity choices. *SSRN eLibrary*.
33. Fischer, O. E., Heinkel, R., & Zechner, J. (1989). Dynamic capital structure choice:theory and tests. *The*

Journal of Finance(44), 19-40.
34. Flannery, M. J., & Rangan, K. P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics*(79), 469-506.
35. Flannery, M., & Hankins, K. (2007). A Theory of Capital Structure Adjustment Speed.
36. Frank, M. Z., & Goyal, V. (2008). Trade-off and Pecking Order Theories of Debt. In *Handbook of Empirical Corporate Finance:* (p. Elsevier Science.). 135-202: Elsevier Science.
37. Frank, M., & Goyal, V. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*(67), 217-248.
38. Frank, M., & Goyal, V. (2007). Capital Structure Decisions: Which Factors are Reliably Important? *Unpublished working paper*.
39. Gaud, P., Jani, E., Hoesli, M., & Bender, A. (2005). The capital structure of Swiss companies: an empirical analysis using dynamic panel data. *European Financial Management, 11*(1), 51-69.
40. Getzmann, A., Lang, S., & Spremann, K. (2010). *Determinants of the target capital structure and adjustment speed–evidence from Asian capital markets.* Retrieved April 13, 2012, from http://www.uibk.ac.at/ibf/sonstiges/seminar/targetcapitalstructureasia.pdf.
41. Gwatidzo, T. (2008). The determinants of capital structure in Sub-Saharan Africa. *unpublished PhD manuscript.* Johannesburg: Witwatersrand University.
42. Gwatidzo, T., & Ojah, K. (2009). Corporate capital structure determinants: evidence from five African countries. *African Finance Journal., 11*(1), 1-23.
43. Haas, R., & Peeters, M. (2006). The dynamic adjustment towards target capital structures of firms in transition economies. *Economics of Transition, 14*(1), 133-169.
44. Halling, M., Yu, J., & Zechner, J. (2011). Leverage Dynamics over the Business Cycle. *Unpublished working paper.*
45. Harris, M., & Raviv, A. (1990). Capital Structure and the Informational Role of Debt. *Jounal of Finance, 45*, 321-349.
46. Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance, 46*, 297-355.
47. Honore, Bo, & Hu., L. (2003). Estimation of Cross Sectional and Panel Data Censored Regression Models with Endogeneity. *Working Paper No.4.* Princeton: Princeton University.
48. Hovakimian, A., & Li, G. (2009). Do firms have unique target debt ratios to which they adjust? *Working Paper*.
49. Hovakimian, A., T. O., & Titman., S. (2001.). The debt-equity choice. *Journal of Financial and Quantitative Analysis, 36*(1), 1-24.
50. Hsiao, C. (1986). *Analysis of Panel Data.* New York: Cambridge University.
51. Huang, R., & Ritter, J. (2009). Testing Theories of Capital Structure and Estimating the Speed of Adjustment. *Journal of Financial and Quantitative Analysis*(44), 237-271.
52. Iliev, P., & Welch, I. (2010). Reconciling Estimates of the Speed of Adjustment of Leverage Ratios. *Unpublished working paper*.
53. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: managerial behaviour, agency costs and the ownership structure. . *Journal of Financial Economics*(3), 305-360.
54. Ju, Parrino, R., Poteshman, A., & Weisbach, M. (2002). Horses and Rabbits? Optimal dynamic Capital Structure from shareholder and manager perspectives. *NBER Working Paper No. w9327.*
55. Kim, E. H. (1978). A mean-variance theory of optimal capital structure and corporate debt capacity. *Journal of Finance*(33), 45-63.
56. Kraus, A., & Litzenberger, R. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*(28), 911-922.
57. Kremp, E., Stöss, E., & Gerdesmeier, D. (1999). Estimation of a debt function: Evidence from French and German firm panel data. *A joint research of the Deutsche Bundesbank and the Banque de France*, 139-194.
58. Kyaw, N. A. (2009). International corporate capital structure: dynamics and determinants. *Journal of International Business and Economy, 10*(2), 1-38.
59. Leary, M., & Roberts, M. (2005). Do Firms Rebalance their Capital Structures? *The Journal of Finance*(60), 2575-2619.
60. Mackie-Mason, J. K. (1990). Do taxes affect financing decisions? *Journal of Finance*(45), 1471-1493.
61. Mahakud, J., & Mukherjee, S. (2011). Determinants of Adjustment Speed to Target Capital Structure: Evidence from Indian Manufacturing Firms. *2011 International Conference on Economics and Finance Research* (pp. 67-71). IACSIT Press.
62. Modigliani, F., & Miller, M. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*(48), 361-297.
63. Modigliani, F., & Miller, M. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review*(53), 433-443.
64. Modigliani, F., & Miller, M. (1966). Some Estimates of the Cost of Capital to the Electric Utility Industry 1954-57. *The American Economic Review*(56), 333-391.
65. Myers, S. C. (1977). Determinants of corporate borrowing. . *Journal of Financial Economics*(5), 147-175.
66. Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*(39), 575-592.
67. Myers, S. C. (2001). Capital structure. *Journal of Economic Perspectives* (15), 81-102. .
68. Myers, S. C. (2003). Financing corporations. In *Handbook of the Economics of Finance* (Vol. 1.A). New Holland, Amsterdam: Elsevier.
69. Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. . *Journal of Financial*(13), 187-221.
70. Nivorozhkin, E. (2003). The dynamics of capital structure in transition economies. *BOFIT Discussion Papers*(2).
71. Ozkan, A. (2002). An empirical analysis of corporate debt maturity structure. *European Financial Management, 6*(2), 197-212.
72. Parsons, C., & Titman, S. (n.d.). Capital structure and corporate strategy. In *Handbook of Corporate Finance: Empirical Corporate Finance* (Vol. 2 B). Amsterdam, Elsevier, North Holland.
73. Prasad, S., Green, C., & Murinde, V. (2001). Corporate structures in developing economies: evidence from a comparative analysis of Thai and

Malay corporations. *Finance & Development Research Programme*.
74. Rajan, G. R., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance* (50), 1421-1460.
75. Ramjee, A., & Gwatidzo, T. (2012). Dynamics in capital structure determinants in South Africa. *Meditari Accountancy Research, 20*(1), 52-67.
76. Roodman, D. M. (2006). *How to Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata*. Washington: Center for Global Development.
77. Shah, K. (2011). Financial Reforms and Dynamics of Capital Structure Choice: A Case of Publically Listed Firms of Pakistan. *Journal of Management Research, 3*(1), 1-16.
78. Shleifer, A., && Vishny, R. (1992). Liquidation values and debt capacity: a market equilibrium approach. *Journal of Finance, 47*, 1343–1366.
79. Shyam-Sunder, L., & Myers, S. (1999). Testing static tradeoff against pecking order models of capital structure. *Journal of Financial Economics*(51), 219-244.
80. Sobrinho, L. R. (2010). Country Factors and the Dynamic Modeling of Capital Structure: an Empirical Study of Latin American Firms. *Unpublished manuscript*.
81. Song, J., & Philippatos, G. (2004). Have we resolved some critical issues related to international capital structure? Empirical evidence from the 30 OECD countries. *Working Paper*.
82. Stulz, R. (1990). Managerial Discretion and Optimal Financing Policies. *Journal of Financial Economics*(26), 3-27.
83. Terra, P. R. (2002). An Empirical Investigation on the Determinants of Capital Structure in Latin America. *Annals of XXVI ENANPAD*.
84. Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *Journal of Finance*(43), 1019.
85. Wald, J. (1999). How firm characteristics affect capital structure: an international comparison. *Journal of Financial Research*(22), 161-187.
86. Warner, J. B. (1977). Bankruptcy Costs: Some Evidence. *The Journal of Finance* (32), 337-347.
87. Welch, I. (2004). Capital structure and stock returns. *Journal of Political Economy, 12*(1), 106-132.
88. Zhao, T., & Susmel, R. (2008). Testing the Trade-off Theory of Capital Structure: A Kalman Filter Approach. *Working Paper*.

Appendix

A1. Correlation matrix of variables used in the regression (2000-2011)

Ghana

	VSD	VLD	VTD	VDC	Pr ofitability	T angibility	ize	rowth	olatility V
LVSD	.000								
LVLD	0.262	.000							
LVTD	.781	.628	.000						
LVDC	.781	.628	.000	.000					
Profitab ility	0.468	0.362	0.578	0.578	1. 000				
Asset Tangibility	0.178	.384	0.008	0.008	- 0.355	1 .000			
Size	0.120	0.208	0.123	0.123	0. 212	0 .051	.000		
Growth	0.110	0.168	0.207	0.207	0. 401	- 0.292	.202	.000	
Volatilit y	0.084	0.094	0.089	0.089	0. 262	- 0.101	0.009	.172	1 .000

Kenya

	VSD	VLD	VTD	VDC	Pr ofitability	T angibility	ize	rowth	olatility V
LVSD	.00								
LVLD	0.26	.00							
LVTD	.78	.63	.00						
LVDC	.78	.63	.00	.00					
Profitab ility	0.47	0.36	0.58	0.58	1. 00				
Asset Tangibility	0.18	.38	0.01	0.01	- 0.36	1 .00			
Size	0.12	0.21	0.12	0.12	0. 21	0 .05	.00		
Growth					0.	-			

	0.11	0.17	0.21	0.21	40	0.29	.20	.00	
Volatilit y	0.08	0.09	0.09	0.09	0. 26	- 0.10	0.01	.17	1 .00

Nigeria

	VSD	VLD	VTD	VDC	Pr ofitability	T angibility	ize	rowth	V olatility
LVSD	.000								
LVLD	0.278	.000							
LVTD	0.998	.281	.000						
LVDC	0.998	.281	.000	.000					
Profita bility	.232	0.127	0.207	0.207	1. 000				
Asset Tangibility	.212	.235	0.093	0.093	- 0.017	1 .000			
Size	0.068	0.158	0.028	0.028	0. 187	- 0.142	.000		
Growt h	0.028	0.087	.015	.015	0. 049	- 0.077	.021	.000	
Volatili ty	.045	0.042	0.039	0.038	0. 244	0 .022	.100	0.104	1 .000

South Africa

	VSD	VLD	VTD	VDC	Pr ofitability	T angibility	ize	rowth	V olatility
LVSD	.000								
LVLD	0.310	.000							
LVTD	.587	.502	.000						
LVDC	.587	.502	.000	.000					
Profita bility	0.117	0.158	0.186	0.186	1. 000				
Asset Tangibility	0.559	.420	0.093	0.093	- 0.045	1 .000			
Size	0.112	0.018	.051	.051	0. 294	0 .220	.000		
Growt h	0.069	.006	0.039	0.039	0. 016	0 .070	0.016	.000	
Volatili ty	0.041	.046	.017	.017	0. 056	0 .028	.047	.171	1 .000