DEBT AND FINANCIAL PERFORMANCE OF SMES: THE MISSING ROLE OF DEBT MATURITY STRUCTURE

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Abstract

This paper focuses on an important issue, which has generally received less attention in SMEs literature, being the effect of debt maturity structure on financial performance. The random effects model, as a panel data technique, is used to examine the relationship between debt and various measures of financial performance. The results reveal that it is not the level of leverage that determines financial performance, but rather the debt maturity structure. Specifically, the findings demonstrate that short-term debt and long-term debt have an opposite effect on financial performance and therefore tend to cancel out. This is the first study, to the best of knowledge, which offers empirical evidence regarding debt maturity structure not only in SMEs context, but also from an Egyptian perspective.

Keywords: Capital Structure, Debt Maturity Structure, Egyptian Firms, Financial Performance, SMEs

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1. Introduction

Searching for an optimal capital structure is always considered as a perplexing issue that has attracted a substantial attention in corporate finance. The underlying theme is that the ability of the firm to exploit an appropriate capital structure is likely to result in a sustainable competitive advantage (Barton and Gordon, 1988).To attest this premise, scholars have sought to establish a link between capital structure and various financial as well as managerial issues.

In this context, one stream of research has focused on examining the relationship between leverage and financial performance. Opposing theoretical perspectives are presented in literature either to argue for or against this relationship. “Whereas theories based on signalling and the agency costs resulting from the conflicts of interest shareholders-managers provide arguments in favour of a positive relationship, the research analyzing the agency costs from the diverging interests between shareholders and debtholders suggests a negative relationship” (Weill, 2008: 254). Empirically, researchers (e.g., Majumdar and Chhibber, 1999; Berger and Bonaccorsi di Patti, 2006) have also offered mixed and inclusive evidence regarding this relationship

Critical examination of prior work reveals that two key issues dominate the literature that focuses on the relationship between leverage and financial performance. First, both agency theory and signalling theory represent two extreme viewpoints. This is because, although both theories have different perceptions to illuminate the relationship between owners, management and lenders, they have expressed any of these relationships as a "one-to-one" relationship that works in a vacuity. An apparent inference of this view is that capital structure’s parameters, and hence debt effect, can be articulated and detached from other institutional and structural variables. Thus, the underlying conjecture for both theories is that a certain capital structure is always preferred. Second, it has focused intensively on scrutinizing capital structure theory on large and listed companies (Michaelas et al., 1999). This orientation “has led us to ignore (or study less than necessary) the rest of the universe: the young and small firm, who do not have access to public markets” (Zingales, 2000: 1629). To the best of knowledge, prior work (see, Abor, 2007a; Kyereboah-Coleman, 2007; Weill, 2008; Obert and Olawale, 2010)that examined the effect of dept policy on financial performance in small and medium size enterprises (SMEs) context not only is limited, but also presents mixed conclusions.

This paper highlights an important issue, which has generally received less attention in SMEs literature, being the effect of debt maturity structure on financial performanceIn fact, competing costs and benefits of both short-term and long-term debt implies

that testing the relationship between firm leverage (by adding both short-term debt and long-term debt together) and financial performance may result in spurious conclusions. This is more likely to happen as "most variables influence the maturity structure of debt rather than leverage: the effects on long and short term debt tend to cancel out" (Van der Wijst and Thurik, 1993: 62). In other words, the net effect of opposite influences of long-term debt and short-term debt will determine the net effect of total debt (Hutchinson et al., 1998). This is also more likely to occur, as, although firms may have different polices concerning short-term debt and long-term debt, there is probable to be some interaction between the borrowing levels of both short-term debt and long-term debt (Bennett and Donnelly, 1993).

Thus, this paper aims to show that it is not the level of leverage that determines financial performance, but rather the debt maturity structure. This argument is tested empirically using a sample of Egyptian SMEs. Doing so not only helps to better understand the comparative capital structure debate, but it also can enhance capital structure practices and choices in Egypt as an emerging market. This is also important because "although some of the insights from modern finance theory are portable across countries, much remains to be done to understand the impact of different institutional features on capital structure choices" (Booth et al., 2001: 87).

The rest of this paper is structured as follows. The second part is dedicated to presenting theoretical as well as empirical evidence regarding the relationship between debt and financial performance. The third part is devoted to developing the main hypothesis in this study. Sample and variable measurements are found in the fourth part. Empirical findings are presented in the fifth part. The final part is designated to present conclusion of the focal findings and implications.

2. Theoretical and Empirical Evidence

Since the seminal work of Modigliani and Miller (1958) that argued for debt irrelevance proposition, scholars have sought to propose different theoretical perspectives to establish either a positive or a negative relationship between leverage and financial performance. The first stream of research in this area has focused on asymmetric information and signalling theorems. The underlying theme of this perspective is that asymmetric information between insiders (managers and owners) and outsiders (e.g., lenders) results in imperfect pricing of loans (Stiglitz and Weiss, 1981). On reflection, capital structure is often designed to convey valuable information to lenders (Leland and Pyle, 1977; Esperanca et al. 2003), as debt is considered as an appropriate signal of good-quality firm (Ross, 1977). Thus, the premise of this argument is that leverage and financial performance correlate positively (Weill, 2008).

The second stream of research has explored agency theory (Jensen and Meckling, 1976) to argue also for a positive relationship between leverage and financial performance. The underlying assumption of this contention is that conflict in interests between agents (i.e., managers) and principals (i.e., shareholders) results in a situation in which the agent will always seek to maximize his wealth at the expense of the shareholders value. In this context, relying on debt to finance projects is considered as an effective control mechanism that is often used to evade personal costs of bankruptcy (Grossman and Hart, 1981), and reduce available "free-cash flow" (Jensen, 1986).

The third stream of research has also explored agency theory (Esperanca et al. 2003), and nevertheless posited that leverage exerts a negative effect on financial performance. This conclusion is drawn on the basis of divergence in interests between shareholders and lenders (Jensen and Meckling, 1976), which, in turn, induces shareholders to weight alternatives that maximize their benefits at the expense of lenders, even though these alternatives do not necessary maximize firm value (Weill, 2008). This implies that shareholders may either prefer to invest in risky projects (i.e., overinvestment problem) (Jensen, 1986), or refuse to invest in low-risk projects (i.e., underinvestment problem) (Myers, 1977).

Empirical studies that examined the relationship between leverage and financial performance, in large firms' context, offer competing conclusions. While some studies (e.g., Hadlock and James, 2002; Berger and Bonaccorsi di Patti, 2006) support the positive correlation between leverage and financial performance, other studies (e.g., Titman and Wessels, 1988; Rajan and Zingales, 1995; Majumdar and Chibber,1999; Margaritis and Psillaki, 2010, Lingesiya and Premkanth, 2011) find that leverage tends to inferior financial performance. Yet, other studies (e.g., Philips and Sipahioglu, 2004) conclude that leverage and financial performance have no significant relationship.

In SMEs context, Abor (2007a) analyzed a sample of SMEs that consists of 160 Ghanaian firms and 200 South African firms during the period from 1998 to 2003 and found that the effect of debt on financial performance varies not only with the employed proxy for financial performance, but also with the country of analysis. By employing data for 11836 manufacturing companies during the period 1998-2000 and from seven European countries, Weill (2008) concluded that the relationship between leverage and financial performance varies across countries. Moreover, Obert and Olawale (2010) examined data for 200 Zimbabwean SMEs in 2006 and pointed out that the relationship between debt and financial performance is negative and significant. In a context of microfinance institutions (MFI), Kyereboah-Coleman (2007) revealed, using a panel

data of 52 Ghanaian MFI, that leverage and financial performance are positively correlated.

In effect, mixed findings and inconclusive evidence in presented literature support the conclusion of Booth et al. (2001: 119) that "there is much that needs to be done, both in terms of empirical research as the quality of international databases increases, and in developing theoretical models that provide a more direct link between profitability and capital structure choice". Thus, this study seeks to add to literature by examining an important aspect of SMEs financing, being the effect of debt maturity structure on financial performance.

3. Debt Maturity Structure and Financial Performance: Hypothesis Development

Debt maturity structure refers to the proportion of short-term debt and long-term debt in the firm debt financing. The assumption of either the agency theory or signalling theory as being "one universal optimal capital structure fits all" is unrealistic because it neglects the fact that both short-term debt and long-term debt have related costs and benefits. Short-term debt is argued to mitigate conflict between shareholders and lenders (Jensen, 1986), lessen fixed costs (Titman and Wessels, 1988), generate positive information effect in the presence of asymmetric information (Diamond, 1991), and reduce contracting costs (Myers, 1977; Barclay and Smith, 1995).

However, to assume that short-term debt always suits SMEs disregards important costs and constraints that are associated with this source of finance. For instance, depending on short-term debt may limit the SMEs ability to choose projects with high returns (Caprio and Demirguc-Kunt, 1998; Banga and Sinha, 2003), increase their sensitivity to temporary economic downturns (Titman and Wessels, 1988), and decrease the possibility of adopting more advanced technologies (Caprio and Demirguc-Kunt, 1998). It also could raise flotation costs, opportunity costs of management time in dealing with more frequent debt issues, reinvestment risk and potential costs of liquidity (Barclay and Smith, 1995). Moreover, short-term debt might not only increase the likelihood of debt crisis (Alesina et al., 1990), but also result in less optimal payment structure (Caprio and Demirguc-Kunt, 1998).

On the other hand, long-term debt may allow SMEs to gain various benefits. It is likely to act as an effective mechanism in controlling managerial discretion (Stulz, 1990; Hart and Moore, 1990), affect firm value positively as it reduces the firm's expected tax liabilities (Brennan and Schwartz, 1978; Brick and Ravid, 1985), alleviate the adverse selection problem (Webb, 1991), offer long investment horizon (Hart and Moore, 1990), and reduce sensitivity to provisional economic decline (Titman and Wessels, 1988). Furthermore, by exploiting long-term debt, SMEs are likely to improve productivity (Schiantarelli and Sembenelli, 1996; Caprio and Demirguc-Kunt, 1998), minimize roll-over risk vulnerability (Alesina et al., 1990; Cole and Kehoe, 1996), and be recognized as successful ones (Gilson et al., 1990).

Nevertheless, if SMEs decide to exploit long-term debt, this will not be without costs. Utilizing long-term debt is probable to distort the insiders risk preferences (Myers, 1977), increase information costs (Flannery, 1986; Barclay and Smith, 1995), and raise transaction and fixed costs (Titman and Wessels, 1988).

Opposite costs and benefits of both short-term and long-term debt entails that examining the relationship between total debt, by adding both short-term debt and long-term debt together, and financial performance may lead to spurious findings. This is because "most variables influence the maturity structure of debt rather than leverage: the effects on long and short term debt tend to cancel out" (Van der Wijst and Thurik, 1993: 62). Put simply, the net effect of opposite influences of long-term debt and short-term debt will determine the net effect of total debt (Hutchinson et al., 1998). This is also probably to occur as even though firms may have various polices regarding short-term debt and long-term debt, there is some interaction between the borrowing levels of both short-term debt and long-term debt (Bennett and Donnelly, 1993).

Furthermore, searching for one single optimal leverage level and try to establish a link between this level and financial performance is likely to result in spurious conclusions. Because this logic in research, indeed, discards the idea that debt is a dynamic rather than a static construct that is more likely to change not only in space but also in time. In other words, from a theoretical as well as empirical viewpoint, this construct is time, industry (Michaelas et al., 1999;Van der Wijst and Thurik, 1993; Abor, 2007b), and country (Booth et al., 2001;Weill, 2008) dependent. For instance, although the overall level of leverage may remain fairly stable over time, the relative importance of the various components of debt may change significantly (Bevan and Danbolt, 2000).

Thus, the main argument in this paper is that it is not the level of leverage that determines SMEs financial performance, but rather the debt maturity structure. The premise of this argument is that the choice between long-term debt and short-term debt may affect different real variables choice by the firms (Banga and Sinha, 2003), and capital structure decisions often involve making decisions regarding debt components rather issuing pure debt (De Roon and Veld, 1998). For instance, creditors sometimes renegotiate the debt structure rather than force bankruptcy (Mitra et al., 2007).In addition, by focusing on studying the link between leverage and financial performance we ignore not only the effect of debt maturity structure on SMEs growth (Nunes et al., 2012), but also the fact that some of capital structure

theories have different empirical implications with regard to the maturity structure of debt instruments (Guha-Khasnobis and Bhaduri, 2002). Therefore, the main argument in this paper will be tested empirically through the following hypothesis:

H1: It is expected that the debt maturity structure, rather the level of leverage, affects financial performance

4. Research Methodology

The Egyptian Nile Exchange or the *Nilex* is the sole source that provides published financial data regarding the listed SMEs not only in the Egyptian context but also in the MENA (Middle East and North Africa) region. The *Nilex* database offers an appropriate, secure, yet flexible regulatory framework, for both companies and investors, together with a streamlined admission process. Furthermore, it provides medium and small fast growing businesses, including family-owned businesses, from any country and any industry sector, a clear access to capital and the benefits of being traded (Nilex,2011). One main advantage of using the *Nilex* database is that the measurement and classification of various variables (e.g., total assets and debt) that are stated below are consistent across individual SMEs that are included in this database. This is in fact is an important issues as the use of a diversity of measurements in classification of individual variables may bring the results of the analysis into question.

Since published data on Egyptian SMEs is still its infancy phase, the total number of listed firms in the *Nilex* until 2011 is 19 Egyptian firms. Financial data are available only for 14 firms during the period from 2008 to 2010.Accordingly, these firms represent the sample of the current study with a total number of observations of 42. It may be argued that the small sample size in this study may limit the representativeness of the sample and generalizability of the findings. On reflection, below, different tests are provided to evaluate the internal and external validity of the sample.

The main dependent variable in this study is financial performance (FIN). Prior work has employed various measures as proxies for financial performance. Examples of these include return on assets (ROA), return on equity (ROE), and gross profit margin (GPM) (Michaelas et al., 1999, Abor, 2007a; Kyereboah-Coleman, 2007). The net profit after interest and taxes is divided by book value of total assets and total equity value to generate ROA and ROE, respectively. GPM is proxied by subtracting cost of goods sold from the value of total sales and dividing the difference by total sales.

Total debt and debt maturity structure are the two main independent variables in this study. Following prior work (see, for example, Abor, 2007a; Kyereboah-Coleman, 2007), total debt ratio (TDR) is measured by the ratio of total debt to book value of total assets. The ratio between book value of short-term debt and book value of total assetsis used to express short-term debt ratio (STD). Long-term debt ratio (LTD) is measured by the ratio between book value of long-term debt and book value of total assets.

Following prior studies in SMEs context, a number of control variables that may confound the relationship between debt and financial performance are also included in models of analysis to avoid model misspecification problem.Firm size (SIZ) is expressed by total assets(Abor, 2007a). The natural logarithm is used to transform book value of total assets, as the Shapiro-Wilk W test for normality is significant ($W=0.73617$, $p<0.001$). Firm age (AGE) is signified by the time-period from the incorporation date to the year of analysis (Kyereboah-Coleman, 2007). Liquidity (LIQ) is measured by the ratio of current assets to current liabilities (Lappalainen and Niskanen, 2009). Family ownership (FAM) is proxied by the percentage of shares controlled by the family (Lappalainen and Niskanen, 2009). Assets turnover (TUR) is expressed by the ratio of net sales to total assets (McConaughy et al., 2001). Assets tangibility (TAN) is represented by the ratio of net fixed assets to total assets (Michaelas et al., 1999; Sogorb-Mira, 2005; Weill, 2008). A time trend (TRN) is also included as a control variable in all models. Time-specific factors are accounted for by including the effect for each year (Fidrmuc and Hainz, 2010). Moreover, industry heterogeneity (IND) is captured by inclusion of dummy variables using the two-digit standard industrial classification code (Abor, 2007b). Descriptive statistics of the variables explained above are presented in Table 1.

Table 1. Descriptive Statistics

Variables	Mean	Median	Standard Error	S.D	Coefficient of Variation	25th Percentile	75th Percentile
ROA (%)	11.30	5.96	3.14	18.8	1.67	2.25	14.22
ROE (%)	16.74	8.66	4.80	28.8	1.72	3.66	22.14
GPM (%)	22.98	18.51	5.01	29.2	1.27	13.31	35.34
TDR (%)	35.07	33.21	4.11	24.6	0.70	14.38	47.74
STD (%)	27.53	21.83	3.75	22.4	0.82	7.32	38.85
LTD (%)	7.54	0.03	2.97	17.8	2.36	0	1.77
SIZ (log)	16.87	16.90	0.18	1.09	0.05	16.06	17.63
AGE	8.42	8.50	0.84	5.45	0.64	4	11
FAM (%)	60.88	65.50	3.32	21.5	0.35	41.65	80.30
LIQ	4.41	1.79	1.03	6.13	1.38	1.31	6.34
TUR	1.01	0.85	0.14	0.87	0.85	0.39	1.50
TAN (%)	43.56	39.07	4.65	27.89	0.64	25.36	69.21

(i) *p<0.05; **p<0.01; ***p<0.001
(ii) n = 42

5. Empirical Analysis and Findings

5.1 Sample Size and Validity of Results

As explained above, published data regarding SMEs in the Egyptian context is limited to 14 firms for the period from 2008-2010 with total number of observations of 42. Thus, it is essential before running regression models to determine to what extent the current sample size is able to offer reliable findings that can be generalized. First, one-way analysis of variance (ANOVA) and Kruskal-Wallis, as parametric and nonparametric tests, were conducted to determine if there is a significant amount of variation among the eight industrial sectors, which consist the sample of this study. According to results that are reported in Table 2, both tests are significant, except for financial performance variables. This finding supports the results of Abor (2007b) and provides some assurance regarding data variability in the sample.

Table 2. Compare Means of Variables across Industrial Sectors

Variables	ANOVA (*F*-test)	Kruskal-Wallis (χ^2- test)
ROA (%)	0.79	11.36
ROE (%)	0.57	8.60
GPM (%)	1.64	11.90
TDR (%)	6.35***	23.92**
STD (%)	11.83***	26.27***
LTD (%)	7.31***	17.18*
FAM (%)	12.42***	31.26***
AGE	3.35***	20.11**
SIZ (log)	20.22***	28.21***
LIQ	0.87	27.94***
TUR	5.24**	20.01**
TAN (%)	2.51*	14.77*

(i) *p<0.05; **p<0.01; ***p<0.001
(ii) n = 42

Second, values of all variables in this study were compared with reported means in previous studies in SMEs literature, which not only have used different large sample sizes, but also have been applied on

various institutional contexts. Results that are introduced in Table 3demonstrate, in most of the cases, that there is no significant difference, at 5% significant level, between the mean of the variables and what is reported in prior work. Consequently, these findings give us supportive evidence that the current sample is in accordance with SMEs literature and small sample size is less likely to affect the validity of results in this study.

5.2 Models of Analysis:

The following models of analysis wereused to test the main hypothesis in this study:

$$FIN_{it} = \alpha + b_1 TDR_{it} + b_2 SIZ_{it} + b_3 AGE_{it} + b_4 FAM_{it} + b_5 LIQ_{it} + b_6 TUR_{it} + b_7 TAN_{it} + b_8 TRN_{it} + b_9 IND_i + + \mu_i + v_{it}$$

$$FIN_{it} = \alpha + b_1 STD_{it} + b_2 LTD_{it} + b_3 SIZ_{it} + b_4 AGE_{it} + b_5 FAM_{it} + b_6 LIQ_{it} + b_7 TUR_{it} + b_8 TAN_{it} + b_9 TRN_{it} + b_{10} IND_i + + \mu_i + v_{it}$$

Where, (α) is a constant, ($b_1 : b_{10}$) are the parameters for the explanatory variables. The subscript (*i*) refers to the firm number and the subscript, (*t*) denotes the time period. (μ_i) is the unobservable individual heterogeneity, and (v_{it}) is the remainder disturbance or the usual disturbance in the regression model that varies with individual units and time.

The Hausman (1978) specification test for endogeneity (as explained in Gujarati, 2003) was conducted to check for possible endogeneity between TDR and FIN. Estimating either debt or financial performance individually, in the presence of endogeneity effect, would lead to biased and inconsistent estimates because of the expected correlation between the error term and the endogenous variable. In fact, the Hausman test shows no sign for possible endogeneity between FIN and TDR as the *F*-test for the predicted value of TDR, when ROA, for example, is used as a proxy for financial performance, is not significant (F = 1.89, p=0.1883).

Table 3. Comparing Means of Variables with those in SMEs Literature

Variable	Author	Year	Application Period	Country	Sample	Observations	Mean	*t*-statistics	*p*-value
ROA (%)									
	Michaelas et al.	1999	1988-1995	UK	3500	20500	6.9	1.40	0.1699*
	Sogorb-Mira	2005	1994-1998	Span	6482	32410	9.62	0.535	0.5955*
	Abor	2007a	1998-2003	Ghana	160	N.A	9.25	0.653	0.5177*
				South Africa	200	N.A	-18.62	9.52	0.000
	Kyereboah-Coleman	2007	1995-2004	Ghana	52(MFI)	520	39.1	-8.84	0.000
	La Rocca et al.	2011	1996-2005	Italy	10242	69694	9.9	0.446	0.6579*
	Serrasqueiro and Nunes	2011	1999-2006	Portugal	1845	12053	4.7	2.08	0.0447
ROE (%)									
	Kyereboah-Coleman	2007	1995-2004	Ghana	52(MFI)	520	33.4	-3.46	0.0014
GPM (%)									
	Abor	2007a	1998-2003	Ghana	160	N.A	39.51	-3.30	0.0023
				South Africa	200	N.A	-116.4	27.83	0.000
TDR (%)									
	Michaelas et al.	1999	1988-1995	UK	3500	20500	42.2	-1.73	0.0916*
	Sogorb-Mira	2005	1994-1998	Span	6482	32410	61.41	-6.41	0.000
	Abor	2007a	1998-2003	Ghana	160	N.A	40.01	-1.19	0.2387*
				South Africa	200	N.A	49.89	-3.60	0.0010
	Kyereboah-Coleman	2007	1995-2004	Ghana	52(MFI)	520	76.87	-10.17	0.000
	La Rocca et al.	2011	1996-2005	Italy	10242	69694	0.453	-2.48	0.017
STD (%)									

	Michaelas et al.	1999	1988-1995	UK	3500	20500	30.3	-0.736	0.4661*
	Sogorb-Mira	2005	1994-1998	Span	6482	32410	52.45	-6.64	0.000
	Abor	2007a	1998-2003	Ghana	160	N.A	37.61	-2.68	0.0110
				South Africa	200	N.A	33.17	-1.50	0.1419*
	Kyereboah-Coleman	2007	1995-2004	Ghana	52(MFI)	520	35.49	-2.12	0.0410
	Serrasqueiro & Nunes	2011	1999-2006	Portugal	1845	12053	66.11	-10.29	0.000
LTD (%)									
	Michaelas et al.	1999	1988-1995	UK	3500	20500	11.9	-1.46	0.1514*
	Sogorb-Mira	2005	1994-1998	Span	6482	32410	8.95	-0.489	0.6276*
	Swinnwn et al.	2005	1993-2002	Belgium	899	7192	9.40	-0.625	0.5356*
	Abor	2007a	1998-2003	Ghana	160	N.A	5.18	0.798	0.4325*
				South Africa	200	N.A	18.74	-3.76	0.006
	Kyereboah-Coleman	2007	1995-2004	Ghana	52(MFI)	520	41.38	-11.38	0.000
	Bhaird & Lucy	2010	N.A	Ireland	299	N.A	7.3	0.088	0.9360*
	Serrasqueiro and Nunes	2011	1999-2006	Portugal	1845	12053	6.25	0.434	0.6666*
SIZ (log)									
	Michaelas et al.	1999	1988-1995	UK	3500	20500	£3.44m	-0.425	0.6725*
	Sogorb-Mira	2005	1994-1998	Span	6482	32410	13.89	16.249	0.000
	Kyereboah-Coleman	2007	1995-2004	Ghana	52(MFI)	520	14.517	12.91	0.000
	La Rocca et al.	2011	1996-2005	Italy	10242	69694	16.37	2.74	0.009
	Serrasqueiro and Nunes	2011	1999-2006	Portugal	1845	12053	14.3602	13.72	0.000
AGE									
	Michaelas et al.	1999	1988-1995	UK	3500	20500	23.3	-17.66	0.000
	Kyereboah-Coleman	2007	1995-2004	Ghana	52(MFI)	520	7.826	0.716	0.4782*
	La Rocca et al.	2011	1996-2005	Italy	10242	69694	2.88 (log)	-7.62	0.000
	Serrasqueiro and Nunes	2011	1999-2006	Portugal	1845	12053	1.764 (log)	1.934	0.0601*
FAM (%)									
	Lappalainen & Niskanen	2009	2007	Finland	600	3224	52.34	2.75	0.0137
LIQ									
	Lappalainen & Niskanen	2009	2007	Finland	600	2366	2.35	1.04	0.3030*
TUR									
	McConaughy et al.	2001	1986-1988	USA	219	80	1.07	-0.3807	0.7057*
TAN (%)									
	Michaelas et al.	1999	1988-1995	UK	3500	20500	35.3	1.78	0.0843*
	Sogorb-Mira	2005	1994-1998	Span	6482	32410	44.04	0.103	0.9185*
	Weill	2008		Belgium		1279	37.3	1.34	0.187*
				France		3029	30.58	2.79	0.0084
			1998-2000	Germany		314	43.92	-0.077	0.9389*
				Italy		4403	30.99	2.70	0.0105
				Norway		409	42.13	0.307	0.7601*
				Portugal		90	46.55	-0.624	0.5245*
				Spain		2312	38.93	0.996	0.3260*
	La Rocca et al.	2010	2000	Italy	9515	9515	39	0.9810	0.3333*

(*) There is no difference, at 5% significant level, between the mean of the variable and what is reported in prior work.

Table 4. GLS Estimates of the Impact of Total Debt and Debt Maturity Structure on Financial Performance

Dependent Variable: Financial Performance	ROA		ROE		GPM		FAC	
	Total Debt Model	Debt Maturity Structure	Total Debt Model	Debt Maturity Structure	Total Debt Model	Debt Maturity Structure	Total Debt Model	Debt Maturity Structure
TDR	-0.131		0.046		-0.512		-0.364	
	(0.195)		(0.579)		(0.288)		(0.789)	
STD		-0.450*		-0.232*		-0.750**		-1.99***
		(0.183)		(0.09)		(0.273)		(0.609)
LTD		0.773**		1.22**		0.741*		3.40***
		(0.279)		(0.427)		(0.412)		(0.897)
SIZ	0.140*	0.139*	0.194	0.259**	0.329**	0.297**	0.815**	0.690***
	(0.064)	(0.054)	(0.441)	(0.083)	(0.106)	(0.100)	(0.262)	(0.181)
AGE	-0.023	-0.008	0.0001	0.006	0.022	0.044	0.002	0.102**
	(0.015)	(0.014)	(0.048)	(0.021)	(0.027)	(0.028)	(0.063)	(0.039)
FAM	-0.013*	-0.105*	-0.003	-0.009	-0.001	0.002	-0.033	-0.014
	(0.005)	(0.004)	(0.021)	(0.007)	(0.007)	(0.007)	(0.022)	(0.013)
LIQ	-0.0001	-0.0001	-0.004	-0.0001	-0.0001	-0.0001	-0.0005	-0.0008**
	(0.0009)	(0.0001)	(0.003)	(0.0001)	(0.0001)	(0.0001)	(0.0003)	(0.0002)
TUR	0.217***	0.203***	0.517**	0.263***	0.019	-0.009	0.683***	0.495***
	(0.045)	(0.037)	(0.195)	(0.057)	(0.066)	(0.063)	(0.181)	(0.141)
TAN	-0.105	-0.296*	0.457	-0.492*	-0.737*	-1.01**	-1.58*	-3.02***
	(0.189)	(0.169)	(0.785)	(0.259)	(0.310)	(0.319)	(0.776)	(0.557)
Time Effects (*F*-test)	4.20	1.74	1.83	1.33	6.42*	9.93**	1.69	6.58***
Industry Effects (*F*-test)	23.88**	40.23***	34.67***	41.71***	37.85***	46.60***	28.97***	177.84***
Wald (χ^2)	66.80***	100.54***	61.65***	83.11***	92.06***	108.11***	68.11***	417.70***
F-test	0.26	0.03	0.25	0.05	0.16	0.06	0.32	0.05
B-P LM test	5.81*	9.64**	5.29*	8.91**	7.51**	8.93**	9.43**	5.76*
Heteroscedasticity	15082.3***	142.54***	1553.7***	11468.2***	1815.1***	1503.39***	5398.29***	312.99***
Serial correlation	38.05***	0.713	64.37***	2.26	0.099	0.335	318.07***	4.40*
AIC	-17.33	-25.52	134.41	3.45	3.39	1.93	79.86	42.60
BIC	10.14	3.47	160.36	32.45	30.86	30.37	107.34	71.60
LR test (χ^2)		10.19**		134.96***		3.99*		39.26***

(i) *p<0.05; **p<0.01; ***p<0.001
(ii) n = 42
(iii) Figures in brackets are standard errors robust to heteroscedasticity
(iv) F-test provides a test of the pooled OLS model against the fixed effects model based on the OLS residuals.
(v) B-P LM test is the Breusch and Pagan (1980)'s Lagrange Multiplier statistic that provides a test of the pooled OLS model against the random effects model based on the OLS residuals.
(vi) Wald is the Wald test (χ^2) for model goodness-of-fit
(vii) Heteroscedasticity is the modified Wald statistic for group-wise heteroscedasticity (Greene, 2003)
(viii) Serial correlation is the Wooldridge test for autocorrelation in panel-data models (Wooldridge, 2002).
(ix) AIC and BIC are the standard information criteria for model selection, as a lower figure means a better-specified model (Greene, 2003).
(x) LR test for nested model is the likelihood ratio test of each of the debt maturity structure models against the each of the total debt models.

The above stated hypothesis was tested through panel data regression. Employing panel data analysisenables researchers to control for unobservable firm-specific effects and, hence, has the potential to provide a much more powerful evidence base (Baltagi, 1995). The *F*-test (Baltagi, 1995) and the Breusch and Pagan (1980) Lagrange Multiplier (B-P) test were conducted to decide between pooled regression and the alternatives of panel data (fixed effects and random effects, respectively). Results that are introduced in Table 4 indicate that while the *F*-test was not significant under any case, the B-P test was significant in all cases. The implication of this result is that the random effects model is preferred to the fixed effects model as well as the pooled model.

Heteroscedasticity and serial correlation are two serious problems that can affect the estimate of random effects model. The presence of these problems means that the standard errors associated with each regression coefficient will not be correct (Gujarati, 2003). Therefore, the modified Wald test (Greene, 2003), and the Wooldridge test (Wooldridge, 2002) were performed to check for heteroscedasticity and serial correlation, respectively, and results are reported in Table 4. The results show that while heteroscedasticity exists in all model of analysis, serial correlation appears to be a problem in "Total Debt Model" when ROA and ROE are used as proxies for financial performance. The generalized least squares (GLS) was employed to correct for

heteroscedasticity and serial correlation in the case of random effect model (Hausman, 1978), and results are introduced in Table 4.

The results of ROA model demonstrate that debt maturity structure, and rather total debt affects firm financial performance. Specifically, while short-term debt ratio has exerted a negative and significant coefficient on ROA (-0.450, $p<0.05$), long-term debt ratio shows to have a positive and significant coefficient (0.773, $p<0.01$). This finding, as reported in Table 4, seems to be valid even when either ROE or GPR is used as a proxy for financial performance. These results give supportive evidence for the applicability of the main hypothesis in this study.

More analysis was performed, to differentiate between the examined models, by computing the standard information criteria (namely the Akaike information criterion or AIC and the Bayesian information criterion or BIC) for all models of analysis (Greene, 2003). The AICs for the "Total Debt Model", under ROA, ROE and GPR,are -17.33, 134.41, and 3.39, whereas the values of the BICare10.14, 160.36, and 30.8, correspondingly. Yet, while the values of AIC for the "Debt Maturity Structure Model" are -25.52, 3.45, and 1.93, the figures of BIC are 3.47, 32.45, and 30.37, respectively. Remembering that for both AIC and BIC a lower figure means a better specified model, both criteria demonstrate that the "Debt Maturity Structure Model" is superior to "Total Debt Model", under any case. Then a likelihood ratio (LR) test of each of the "Debt Maturity Structure" models against each of the "Total Debt" models was conducted. As it is reported in Table 4, the LR (χ^2) statistics for ROA, ROE, and GPR are 10.19 ($p<0.01$), 134.96 ($p<0.001$), and 3.99 ($p<0.05$), respectively. This is very strong evidence that the debt maturity structure, and rather the total debt level, does indeed show a stronger pattern of association with financial performance. Put another way, the debt maturity structure does appear to add something unique in explaining differences in financial performance of SMEs.

With regard to control variables, results of "Debt Maturity Structure" model, as a better-specified model, demonstrate that while firm size and assets turnover correlate positively with financial performance, assets tangibility shows to have a negative and significant coefficient. Family ownership has exerted a negative and significant effect on financial performance, only when ROA is used as a proxy for financial performance. In addition, industry effects are found to be significant variables in determining financial performance.

To check for the rigor of the main findings presented above, factor analysis was explored to construct a factor using all three measures of financial performance (i.e., ROA, ROE, and GPR). Principal component analysis with Varimax as a common orthogonal rotation method was used on the standardized forms of the three variables. The output financial performance factor (FAC) has value of 2.08439. Validity of the resulted factor is assured as the Bartlett's test of Sphericity is significant (Chi-Square 62.658, $p<0.001$), and Cronbach's alpha statistic is 0.7548(Tabachnick and Fidell 2001).

The resulted factor (FAC) was used as a dependent variable to examine the effect of total debt and debt maturity structure (results are also reported in Table 4). The validity of the main hypothesis in this study is once again assured, while total debt ratio does not affect FAC (-0.364, $p=0.645$), short-term debt as well as long-term debt shows to have a significant coefficient (-1.99 and 3.40, $p<0.001$, respectively). Furthermore, according to the figures of AIC and BIC, the "Debt Maturity Structure" model is still superior to "Total Debt" model, and LR test is significant (39.26, $p<0.001$).

In sum, the above findings offer strong supportive evidence for the applicability of current study's hypothesis. Particularly, the results demonstrate that it is not the level of debt that determines financial performance, but rather the debt maturity structure. The results suggest that short-term and long-term debt have an opposite effect on financial performance and therefore tend to cancel out. The general conclusion is that "there is no one best design of either leverage or debt structure, but different designs are not equally good".

6. Conclusion and Implications

Prior work that examine the relationship between debt policy and financial performance, in large firms, offers opposing theoretical perspectives as well as empirical evidence either to argue for or against this relationship. In a similar vein, studies that investigate this relationship in SMEs context not only is limited, but also presents inconclusive conclusions.

This paper focuses on an important issue, which has generally received less attention in SMEs literature, being the effect of debt maturity structure on financial performance. It argues that it is not the level of leverage that determines financial performance, but rather the debt maturity structure. By employing a sample of Egyptian SMEs, panel data analysis provides a strong evidence for the applicability of this argument. Specifically, the results demonstrate that short-term debt and long-term debt have an opposite effect on financial performance and therefore tend to cancel out. The general conclusion is that "there is no one best design of either leverage or debt structure, but different designs are not equally good".

The findings of this paper have various implications for practitioners, policymakers, and management research. As for practical implications, the insignificant impact of total debt ratio on firm financial performance indicates that leverage cannot be entirely explained by focusing only on its relationship with financial permanence and blaming

leverage for inferior performance. Rather, practitioners need to widen their perception to recognize that the optimal capital structure is a multidimensional, dependent, and dynamic decision that differs with the various characteristics of the firm, as well as contextual variables. Accordingly, for those who are interested in maximizing their firm's value, this though is likely to guide them in selecting and executing the proper debt structure, and hence, the right capital structure.

This study also has some implications for policymakers. First, the results of this study clarify that access to long-term debt, and rather short-term debt, should guarantee that SMEs are able to enhance their performance. Thus, policymakers are required, especially in developing countries, to exert more effort in developing and implementing mechanisms that enable SMEs to access the long-term external financing resources. This is a crucial issue as the efficiency of the legal system and accessibility to bank credit moderate the effect of leverage on financial performance of the SMEs (Weill, 2008). Second, the negative and significant effect of family ownership, which is documented in this study, means that policymakers are urgently required to commence some initiatives that help SMEs develop their costly corporate governance systems. Third, since possibility of expropriation is increased in contexts that characterized by poor accounting and disclosure practices (Faccio et al., 2001), more consciousness should be directed at increasing information accessibility in developing and developed countries. This can be accomplished by initiating corporate governance rating institutes as well as firming disclosure and transparency rules.

For management research in SMEs context, the findings reported here open new directions for future studies. One main limitation that this study was faced with is the use of small sample size. Thus, future work could replicate and retest the argument that is presented here in other institutional settings by employing large sample size.This replication is likely to verify to what extent that literature related to debt and larger firms in the finance discipline on SMEs context is congruent across these sectors.

Second, since this is, to the best of my knowledge, the first study that examines the relationship between debt and SMEs performance in the Egyptian context, comparative future research is invited to explore the role of country's regulations, relationship lending and credit classification in the relationship between debt and financial performance. Such these studies are likely to enhance our understanding of SMEs finance. This is because, for instance, "stronger firm–bank relationships lengthen the maturity of bank loans and that this association is country specific" (Hernandez-Canovas and Koeter-Kant, 2008:595).

Third, investigating the interrelationships that exist between leverage and SMEs performance along firm life cycle and how the outcomes may vary with the lifecycle stages is also a promising future area for researchers. This is because organizational characteristics, variables, and priorities vary with the firm life cycle stage (Miller and Friesen, 1984), and hence, firm growth may moderate the relationship between leverage and firm value (McConnell and Serveas, 1995). Fourth, since the level of short-term debt varies with financial strength, financial flexibility, growth options, interest cost and firm size (Garcis-Teruel and Martinez-Solano, 2007), examining the moderating effect of these variables on the relationship between debt structure and financial performance in SMEs context is another promising area for future research.

Finally, as the results of this study showed that industry heterogeneity is an important variable in determining the relationship between debt and financial performance, future studies are invited to extend this issue by examining and construing the direction of this relationship. In other words, it will be worthwhile, in future studies, to examine, for example, the link between industry instability and debt structure.

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