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Determinants of Capital Structure in Bahrain Stock Market

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Abstract

The aim of this paper is to examine the determinants of capital structure (profitability, size, risk and growth). The sample is composed of 39 Bahraini firms listed in Bahrain Stock Market. The study covered the period 2011-2015. Correlation and regression analysis have been used to identify the relationship between the capital structure determinants and debt leverages (book leverage and market leverage). Correlation analysis aims to identify this relationship at market level and at sectorial level. Regression analysis objective is to anticipate the models characterizing the relationships between determinants and capital leverages. Results of the analysis shows negative significant relationship between profitability and dependent variables, with more significance relationship with market leverage. This relationship is demonstrated in market level and in insurance and services sectors between profitability and book leverage. When the market leverage is the dependent variable this relationship is valid in market level and in banking, hotels, insurance and services sectors. Positive significant relationship has been found between size and both leverages in market level. Similar result is detected on sectorial level in banking, industrial, investment and services when the dependent variable is book leverage. Size-market leverage relationship is positive and significant also in insurance, investment and services sectors. The relationship risk—book leverage is significant only on sectorial level in Industrial, insurance and investment sectors. In term of market leverage—risk relationship, significant relationship is detected in market level and in investment and services sectors. Regression analysis results present a significant linear model reflecting the relationship between determinants of capital structure and leverages.

Keywords: Bahrain Bourse Stock Market, Capital structure, Book leverage, Market leverage Profitability, Firm size, Risk, Growth, Book leverage, Market leverage

1. Introduction

Capital structure puzzle is widely discussed and tested in the literature review. The question of optimal capital structure is one of the most research topics treated in the fields of modern corporate finance and corporate governance. Despite the existence of theoretical background and models, as well as the results of important empirical researches, but capital structure selection and factors affecting this decision still controversial issue. Earlier effort given by Modigliani & Miller (1958) and the extensive work of the successors couldn't give a clear answer about factors affecting capital structure and the combination of debt and equity in the capital structure (Rajan & Zingales, 1995; Gill et al., 2011). Firm's management still consider capital structure decision as one of the strategic decisions, which affects the cost of debt and maximize the shareholders' wealth (Block & Hirt, 1994; Bain & Band, 2016).

Despite the huge literature related to the capital structure determining factors and capital structure choices in developed countries, it is still at earlier stage in the developing countries like Bahrain and other Gulf countries. For that reason, this paper endeavors to inspect the determinants of capital structure (profitability, size, risk and growth) of a sample of 39 Bahraini firms listed in Bahrain Bourse (stock market) over the period 2011-2015. This study is the first study examining the capital structure determinant in Bahrain Stock market. All the sectors of stock market are covered by the study: Banking, Hotels & Tourism, Industrial, Insurance, Investment, Services. Financial analysis has been done to the financial statements of the sample by using Microsoft Excel 2010. The Statistical Package for the Social Sciences (SPSS 16.0) has been used to identify the relationship between the dependent and the independent variables.

Following this introduction, the rest of the paper is structured as follows. Literature review of the research is presented in section (2). Formulating the Research Hypothesis and Null Hypothesis detailed in section (3). In section (4), the sample of the study is presented. Data collection and research Methodology are presented in section (5). Research models are developed in section (6). Findings of the empirical results and hypotheses experimentation are discussed in section (7). Finally, section (8) is assigned to the concluding remarks of the study.

2. Literature Review

Several studies on capital structure determinants have been published in the related literature. The theoretical framework of capital structure theory was presented first by Modigliani & Miller (1958). In their theory, Modigliani & Miller (MM) proved that under the hypotheses of perfect capital markets, no taxes, no bankruptcy, no transaction costs, the firm value is independent of its capital structure. According to MM, debt-to-equity ratio has no impact on the total value of firm. Based on MM theory, the two main theories of capital structure were developed, which are the trade-off theory (Kraus & Litzenberger, 1973; Myers, 1977) and the pecking-order theory (Myers & Majluf, 1984; Myers, 1984).

2.1 Trade-off Theory

As per Myers (1984) trade-off theory is the balance between tax savings from debt and

deadweight bankruptcy costs. According to this theory, capital structure choices are determined by a trade-off between the benefits and costs of debt (Kraus & Litzenberger, 1973). As explained by many researchers, optimal capital structure of organizations involves the tradeoff among the bankruptcy costs and agency costs, the effects of corporate and personal taxes (Jensen & Meckling, 1976), bankruptcy costs, tax benefits, and agency costs related to asset substitution (Myers, 1977), and overinvestment (Jensen, 1986; Stulz, 1990). The trade-off hypothesis assumes a positive relationship between profitability and leverage because low profitability may increase bankruptcy risk (Kayo & Kimura, 2011).

2.2 Pecking Order

Founders of the pecking order theory Myers & Majluf (1984) and Myers (1984) assume that firms issue first internal funds, debt, and then equity. The pecking order theory is based on the information asymmetries, which exist between insiders and outsiders of the firm (management and investors). There is no concept of target capital structure for a firm in the pecking order theory, which exists in the trade-off theory (Dang, 2013). Per reference to the pecking order theory, firms with higher profitability will prefer internal financing to debt and therefore a negative relationship is expected between profitability and capital leverage (Fama & French, 2002; Delcoure, 2007; Daskalakis & Psillaki, 2008; Chakraborty, 2010; Kayo & Kimura, 2011; Joeveer, 2013; Chakraborty, 2013; Dang, 2013; Meero, 2015).

Several empirical research results support the negative relationship between capital structure and firm's performance like the research of Barton et al. (1989); Michael, Chittenden, & Poutziouris (1999); Mishra & McConaughty (1999); Jordan, Lowe, & Taylor (1998); Chittenden, Hall, & Hutchinson (1996). They support a negative relationship between profitability and capital structure. This conclusion is also has been found by Titman & Wessels (1988); Rajan & Zingales (1995) who find strong negative relationships between debt ratios and past profitability. Jensen, Solberg, & Zorn (1992) and Li (2010) find also a negative relationship between the business performance and debt ratio.

2.3 The Factors Affecting the Capital Structure

Literature review related to determinants of capital structure shows variety of variables that have been used to identify this relationship. Profitability, size and growth almost have been used as independent variables in the study of Chen (2004); Hijazi & Tariq (2006); Frank & Goyal (2009); Chhapra & Asim (2012); Khrawish & Khraiwesh (2010); Sbeiti (2010); Afza & Hussain (2011); Baharuddin et al. (2011); Abdul Wahab et al. (2012); Pahuja & Sahi (2012); Maxwell & Kehinde (2012); Mokhova & Zinecker (2013); Ghazouani (2013); Qayyum (2013); Fauzi et al. (2013); Awan & Amin (2014); AbWahab & Ramli (2014); Handoo & Sharma (2014); Huang & Shen (2015); Meero (2015); Naim Nasimi (2016).

Some studies also focused on the risk as independent variable determining the capital structure of the firm. For example of these studies, the research of Hsia (1981); Demsetz & Lehn (1985); Titman & Wessels (1988); Booth, Aivazian, DemirgucKunt, & Maksimovic (2001); Chen (2004), Buferna et al. (2005); Huang & Song (2006); Ghazouani (2013); Naim Nasimi (2016). In addition to profitability, size, growth and risk, some studies have tested the

effect of another variables on capital structure like: tangible and intangible assets (Rajan & Zingales, 1995), liquidity (Strebulaev, 2007), cost of debt (Jensen & Meckling, 1976), tax rate (Sibilkov, 2009), depreciation (Teker et al., 2009). For the current study, profitability, size, growth and risk will be considered as independent variables and book leverage and market leverage as dependent variables.

2.3.1 Profitability

There is no obvious result explaining the effect of profitability on the capital structure. Contradictory theoretical and practical predictions on the effects of profitability on leverage have been found. As it has been explained, following the pecking-order theory, profitable firms, which have access to retained profits, can use these resources for firm financing rather than outside sources. Per reference to the Trade-off theory, more profitable firms are exposed to lower risks of bankruptcy and have greater incentive to employ debt to exploit interest tax shields. (Jensen, 1986) predicts under certain conditions a positive relationship between profitability and financial leverage. Most empirical studies observe a negative relationship between leverage and profitability (Kester, 1986; Titman & Wessels, 1988; Friend & Lang, 1988; Rajan & Zingales, 1995; Booth, Aivazian, DemirgucKunt, & Maksimovic, 2001; Fama & French, 2002; Huang & Song, 2002; Delcoure, 2007; Daskalakis & Psillaki, 2008; Karadeniz et al., 2009; Chakraborty, 2010; Kayo & Kimura, 2011; Joeveer, 2013; Chakraborty, 2013; Dang, 2013).

2.3.2 Firm Size

Pecking order theory with trade off theory pretend positive and also negative relationship between the organizational leverage and its size. Empirically, certain results find that size of the firm has positive impacts on its leverage like the results of Titman & Wessels (1988); Rathinasamy, Krishnaswamy, & Mantripragada (2000); Huang & song (2006). In the other side negative relationship between size and leverage of the firm has been found by Rajan & Zingales (1995); Shah & Khan (2007); Hernádi & Ormos (2012).

2.3.3 Firm Risk

Optimal capital structure of the firm could be obtained at a lower level of volatility of firm's earnings according to the results of Demsetz & Lehn (1985); Titman & Wessels (1988); Booth et al. (2001). Standard deviation of the return on equity used as a proxy for business risk.

2.3.4 Growth of Sales (revenues)

Reference to pecking order theory high growth firms prefer debts than outside equity financing (Myers & Majluf, 1984). Contrariwise, some empirical studies pretend that growth of the firm increases in the agency costs of debt and to a reduction in the agency costs of managerial discretion which may indirectly affect negatively the financial leverage (Titman, & Wessels, 1988; Smith, & Watts, 1992; Booth, Aivazian, DemirgucKunt, & Maksimovic, 2001; Goyal, & Racic, 2002).

3. The Hypotheses of the Study

As it was presented in the literature review previously discussed, such subject is still a disputable in the capital structure and corporate governance area. This study focuses on the determinants of capital structure in Bahrain Bourse (stock market). The dependent variables representing capital structure are book leverage and market leverage. The independent variables are profitability, size, growth and risk. These variables have been measured as per following equations:

Dependent variables:

1) *Book leverage*

$$Booklev = \frac{total\ liabilities}{book\ value\ (debt + equity)}$$

2) Market leverage

$$Marktlev = \frac{total\ liabilities}{market\ value\ of\ equity + total\ liabilities}$$

Independent variables

1) Profitability

Net Income as percentage of total assets (ROA):

$$ROA = \frac{netincome}{total\ assests}$$

2) Size:

Natural logarithm of total assets:

$$Size = \ln\ (total\ assests)$$

3) Growth:

Growth rate of sales (or revenues), calculated as per the following equation:

$$Growth = \frac{revenue_n - revenue_{n-1}}{revenue_{n-1}}$$

4) Risk:

Defined as the Standard deviation of return on equity ROE, calculated as per the following equation:

$$Risk = \sqrt{\frac{ROE_n - ROE_{n-1}}{ROE_{n-1}}}$$

Since the objective of this study is to look for the factors that have influence on capital

structure, using the variables explained previously, hypotheses of the research are the following:

1) The profitability hypotheses

H0: There is no statistical significant impact of profitability (Profit) on book leverage (booklev).

H1: There is statistical significant impact of profitability (Profit) on book leverage (booklev).

H0: There is no statistical significant impact of profitability (Profit) on market leverage (Marketlev).

H1: There is statistical significant impact of profitability (Profit) on market leverage (Marketlev).

2) The size hypotheses

H0: There is no statistical significant impact of size (size) on book leverage (booklev).

H1: There is statistical significant impact of size (size) on book leverage (booklev).

H0: There is no statistical significant impact of size (size) on market leverage (Marketlev).

H1: There is statistical significant impact of size (size) on market leverage (Marketlev).

3) The growth hypotheses

H0: There is no statistical significant impact of growth (growth) on book leverage (booklev).

H1: There is statistical significant impact of growth (growth) on book leverage (booklev).

H0: There is no statistical significant impact of growth (growth) on market leverage (Marketlev).

H1: There is statistical significant impact of growth (growth) on market leverage (marketlev).

4) The risk hypotheses

H0: There is no statistical significant impact of risk (risk) on book leverage (booklev).

H1: There is statistical significant impact of risk (risk) on book leverage (booklev).

H0: There is no statistical significant impact of risk (risk) on market leverage (marketlev).

H1: There is statistical significant impact of risk (risk) on market leverage (marketlev).

5) Multiple variables hypotheses

H0: There is no statistical significant impact for dependent variables profitability, size, risk and growth on book leverage (booklev).

H1: There is statistical significant impact for dependent variables profitability, size, risk and growth on book leverage (booklev).

H0: There is no statistical significant impact for dependent variables profitability, size, risk and growth on market leverage (marketlev).

H1: There is statistical significant impact for dependent variables profitability, size, risk and growth on market leverage (marketlev).

4. Sample of the Study

The study population consists of all listed companies in Stock Exchange Market-Bahrain Bourse (45 companies). The sample of the study composed of 39 companies covers all the sectors in Bahrain Bourse (Banking, Hotels & Tourism, Industrial, Insurance, Investment and Services. 5 companies were dropped from the sample because they don't have sufficient data as other companies.

Table 1. The sample of the study

	Company	Code	sector
1	National Bank of Bahrain	NBB	Banking
2	Bank of Bahrain & Kuwait	BBK	Banking
3	Ahli United Bank	AUB	Banking
4	Bahrain Islamic Bank	BISB	Banking
5	Al Salam Bank	SALAM	Banking
6	Ithmaar Bank	ITHMR	Banking
7	Khaleeji Commercial Bank	KHCB	Banking
8	Bank Muscat	BMUSC	Banking
9	National Hotels Co.	NHOTEL	Hotels & Tourism
10	Gulf Hotel Group	BHOTEL	Hotels & Tourism
11	Bahrain Family Leisure Co.	FAMILY	Hotels & Tourism
12	Bahrain Tourism Co.	BTC	Hotels & Tourism
13	Banader Hotel Co.	BANADER	Hotels & Tourism
14	Aluminum Bahrain B.S.C	ALBH	Industrial
15	Bahrain Flour Mills Co.	BFM	Industrial
16	Delmon Poultry Co.	POLTRY	Industrial
17	Al Ahlia Insurance Co.	AHLIA	Insurance
18	Arab Insurance Group	ARIG	Insurance
19	Bahrain Kuwait Insurance Co.	BKIC	Insurance
20	Bahrain National Holding Co.	BNH	Insurance
21	Takaful International Co.	TAKAFUL	Insurance
22	Arab Banking Corporation	ABC	Investment
23	Al Baraka Banking Group	BARKA	Investment
24	Bahrain Commercial Facilities Co.	BCFC	Investment
25	Bahrain Middle East Bank	BMB	Investment
26	Esterad Investment Co.	ESTERAD	Investment
27	GFH Financial Group	GFH	Investment
28	INOVEST	INOVEST	Investment
29	United Gulf Bank	UGB	Investment
30	United Gulf Investment Corporation	UGIC	Investment
31	Bahrain Ship Repairing & Engineering Co.	BASREC	Services
32	Bahrain Telecommunication Co.	BATELCO	Services
33	BMMI B.S.C	BMMI	Services
34	Bahrain Cinema Co.	CINEMA	Services

35	Bahrain Car Park Co.	CPARK	Services
36	Bahrain Duty Free Shop Complex Co.	DUTYF	Services
37	Nass Corporation	NASS	Services
38	Seef Properties B.S.C.	SEEF	Services
39	Trafco Group	TRAFCO	Services

5. Data and Methodology

The goal of this research is to investigate the strength and the direction of the relationship (positive or negative linear relationship) between the dependent variables (leverage ratios) and the independent or explanatory variables (profitability, growth, size and risk). This relationship will be tested in two levels: global level or market level (Bahrain Bourse-Stock Market) which covers in one analysis all the companies of the sample together and sectorial level which covers the analysis of each sector of the sectors in Bahrain Bourse stock market. Data from 2011 to 2015 has been used to test the hypotheses of the research. Balance sheets and income statements of the sample have been analyzed by using Microsoft Excel 2010. SPSS 16.0 (Statistical Package for the Social Sciences) has been used to test the statistical relationship between the variables of the research

The rest of this paper is presented as follows: the research models are explained in the paragraph (6). The empirical analysis (paragraph 7) of the determinant factors of capital structure for listed companies in Bahrain Bourse listed are presented and the same relationship is tested in for each sector of Bahrain Bourse stock market.

6. Research Models

Research Model is based on the verification of the existence of linear relationship between dependent and independent variables. In the linear regression model, the dependent variable is assumed to be a linear function of one or more independent variables plus an error considering all other factors. This regression is presented by the function below:

$$Y = \beta 0 + \beta 1 X_i + \varepsilon \quad (1)$$

Where: Y is the dependent variable, X_i is the independent or explanatory variable(s), and ε is the disturbance or error term.

Regression analysis result defines the unknown parameters Beta (β1: The slope of the regression line) which indicates how a change in one unit of the independent variables affects the values taken by the dependent variable. B0 is the intercept point of the regression line and the Y axis. The strength of relationship between dependent and independent variables is measured by Correlation Coefficient ®. The percentage of the total variation in the dependent variable by variation in the independent variable is explained by R-square. Accordingly, research models to be tested in this study are the following:

6.1 Profitability and Capital Structure Model

$$booklev = \beta 0 + \beta 1 Profit + \varepsilon \quad (2)$$

and

$$marketlev = \beta 0 + \beta 1\ Profit + \varepsilon \quad (3)$$

6.2 Size and Capital Structure Model

$$booklev = \beta 0 + \beta 1\ size + \varepsilon \quad (4)$$

and

$$marketlev = \beta 0 + \beta 1\ size + \varepsilon \quad (5)$$

6.3 Growth and Capital Structure Model

$$booklev = \beta 0 + \beta 1\ growth + \varepsilon \quad (6)$$

and

$$marketlev = \beta 0 + \beta 1\ growth + \varepsilon \quad (7)$$

6.4 Risk and Capital Structure Model

$$booklev = \beta 0 + \beta 1\ risk + \varepsilon \quad (8)$$

and

$$Marketlev = \beta 0 + \beta 1\ risk + \varepsilon \quad (9)$$

6.5 The Multiple Regression Model

$$booklev = \beta 0 + \beta 1\ Profit + \beta 2\ size + \beta 3\ growth + \beta 4\ risk + \varepsilon \quad (10)$$

and

$$Marketlev = \beta 0 + \beta 1\ Profit + \beta 2\ size + \beta 3\ growth + \beta 4\ risk + \varepsilon \quad (11)$$

7. Empirical Analysis

This section is organized as follows: (7.1) descriptive statistical analysis of the variables, (7.2) is exploration of the correlation analysis to identify the significance of the relationship between dependent and independent variables. In (7.3) regression models are tested to deduce the linear relationship between the determinants of capital structure and leverages in Bahrain Bourse (Stock Market) listed companies.

7.1 Descriptive Analysis

This descriptive analysis is done at global level (7.1.1. Bahrain Bourse Stock Market) and sectorial level (7.1.2. descriptive analysis by sector)

7.1.1 Bahrain Bourse Stock Market Descriptive Analysis

Table 2 shows descriptive statistics for both the dependent variables and the explanatory variables (independent) of 195 observations. The average leverage ratios for the sample are

(47.82% book leverage; 31.84% market leverage). This result is similar to what Rajan & Zingales (1995) find in United States where they note that book leverage is 52%, and market value leverage is 44%.The profitability ratio shows an average of return on assets (ROA) 3.55%. The average of growth of sales ratio is 5.90%. These results accompanied by an average of business risk about 4.4 %.

Table 2. Sample of the research descriptive statistics (Market level)

	N	Mean	Std. Deviation
Booklev	195	.478227	.3122301
Marketlev	195	.504171	.3184275
Profit	195	.035541	.0577288
Size	195	12.180339	2.0562003
Risk	195	.044541	.0555777
Growth	195	.058938	.5224186
Valid N (listwise)	195		

7.1.2 Sectorial Descriptive Analysis

Table 3 shows a detailed descriptive analysis for dependent and independent variables of the study.

Table 3. Sectors in Bahrain bourse stock market descriptive statistics

	N		**Booklev**	**Marketlev**	**Profit**	**Size**	**Risk**	**Growth**
Bahrain Bourse Stock Market	195	Mean	0.478227	0.504171	0.035541	12.180339	0.044541	0.058938
		Std. Deviation	0.312230	0.318428	0.057729	2.056200	0.055578	0.522419
Hotel Sector	25	Mean	0.145213	0.198614	0.053597	10.397843	0.040405	0.008621
		Std. Deviation	0.115029	0.168632	0.083219	0.985495	0.056872	0.426357
Insurance sector	25	Mean	0.626188	0.603865	0.020161	11.267938	0.064312	0.020999
		Std. Deviation	0.139780	0.182052	0.032046	0.968294	0.056330	0.111960
Industrial Sector	15	Mean	0.176307	0.244582	0.058024	11.226903	0.033072	-0.015775
		Std. Deviation	0.106184	0.119489	0.036749	2.039127	0.026094	0.068670
Banking Sector	40	Mean	0.865671	0.870173	0.006958	14.733049	0.052717	0.087541
		Std. Deviation	0.048004	0.047514	0.014303	1.025908	0.076865	0.171923
Service Sector	45	Mean	0.208197	0.209347	0.084219	11.081926	0.017047	0.026978
		Std. Deviation	0.157272	0.201640	0.042131	1.148823	0.009399	0.138297
Investment Sector	45	Mean	0.607308	0.674559	0.003291	12.824655	0.059904	0.139409
		Std. Deviation	0.216765	0.210326	0.056995	1.963156	0.056836	1.018798

Descriptive table (table 3) shows that the best average profitability is in service sector (8.4%) with standard deviation of (0.04). It shows either that investment sector and banking sector recorded the poorest performance all over the period of the study (0.03% and 0.06%) respectively. Results show also minimum financial risk level in service sector (0.017) with a standard deviation of (0.009). Insurance and Investment sectors are the riskiest with an average of (0.064) and (0.0599). The economic recession and regional conflicts affects directly the profitability and the stability of the revenues in investment and banking sectors. On the other hand, there is almost a good stable domestic and touristic demand for the services sector in Bahrain as it classified as an attractive touristic country for the people from the Gulf countries.

7.2 Correlation Analysis

Correlation between dependent and independent variables is studied market level and sectors level.

7.2.1 Bahrain Bourse Stock Market Correlation Analysis

The results of the Pearson's correlation of the models are shown in the table 4, and described as follows:

A negative significant correlation is observed between profitability, and leverage ratios (market and book leverage). A positive significant correlation is detected between size of the firm, and leverage ratios (market and book leverage). Another positive significant correlation is observed between market leverage and firm risk. A positive non-significant correlation is seen in the relationship between book leverage and firm risk. A positive non-significant correlation also is observed between leverage ratios and firm growth.

Table 4. Bahrain bourse stock market correlation analysis

		Profit	Size	Risk	Growth
Booklev	Pearson Correlation	-.471**	.763**	.135	.091
	Sig. (2-tailed)	.000	.000	.061	.208
	N	195	195	195	195
Marketlev	Pearson Correlation	-.563**	.751**	.141*	.077
	Sig. (2-tailed)	.000	.000	.049	.283
	N	195	195	195	195

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

7.2.2 Bahrain Bourse Stock Market Sectors Correlations Analysis

Correlation analysis sectorial level is done all over the six sectors chosen for this study.

7.2.2.1 Correlation Analysis in Hotel Sector

Pearson's correlation results presented in table 5 show the following remarks:

In hotel sector, only one significant correlation is observed. It is a negative significant correlation between profitability and market leverage. All other correlations between dependent and independent variables are not significant positively or negatively.

Table 5. Hotel sector correlations

		Profit	Size	Risk	Growth
Booklev	Pearson Correlation	-.339	.195	-.268	-.311
	Sig. (2-tailed)	.097	.351	.196	.130
	N	25	25	25	25
Marketlev	Pearson Correlation	-.465*	.181	-.297	-.378
	Sig. (2-tailed)	.019	.388	.150	.062
	N	25	25	25	25

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

7.2.2.2 Correlation Analysis in Insurance Sector

The results of the Pearson's correlation of the model in insurance sector are presented in the table 6, and described as follows:

A negative significant correlation is observed between profitability, and leverage ratios (market and book leverage). A positive significant correlation is detected between size of the firm and market leverage. A positive significant correlation is seen in the relationship between book leverage and firm risk. Another positive non-significant correlation is observed between market leverage and firm risk. A negative non-significant correlation is found between growth and leverages (book and market leverage).

Table 6. Insurance sector correlations

		Profit	Size	Risk	Growth
Booklev	Pearson Correlation	-.611**	.239	.626**	-.062
	Sig. (1-tailed)	.001	.125	.000	.383
	N	25	25	25	25
Marketlev	Pearson Correlation	-.543**	.690**	.242	-.088
	Sig. (1-tailed)	.003	.000	.122	.338
	N	25	25	25	25

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

7.2.2.3 Correlation Analysis in Industrial Sector

In Industrial sector table 5 shows a positive significant correlation between book leverage and two independent variables: size and risk. All other correlations are not significant.

Table 7. Industrial sector correlations

		Profit	Size	Risk	Growth
Booklev	Pearson Correlation	.384	.721**	.645**	-.367
	Sig. (2-tailed)	.157	.002	.009	.178
	N	15	15	15	15
Marketlev	Pearson Correlation	.008	.508	.371	-.320
	Sig. (2-tailed)	.977	.053	.173	.245
	N	15	15	15	15

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

7.2.2.4 Correlation Analysis in Banking Sector

The results of the Pearson's correlation of the model in banking sector are presented in table 8 which shows a significant negative correlation between profitability and market leverage. A positive significant correlation is detected between size of the firm and book leverage. All other correlations are not significant.

Table 8. Banking sector correlations

		Profit	Size	Risk	Growth
Booklev	Pearson Correlation	.042	.505**	.099	-.198
	Sig. (2-tailed)	.799	.001	.542	.220
	N	40	40	40	40
Marketlev	Pearson Correlation	-.544**	-.143	.183	.078
	Sig. (2-tailed)	.000	.380	.258	.634
	N	40	40	40	40

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

7.2.2.5 Correlation Analysis in Service Sector

The results of the Pearson's correlation of the model in service sector are presented in the table 9, and described as follows:

A negative significant correlation is observed between profitability, and leverage ratios

(market and book leverage). A positive significant correlation is detected between size of the firm and leverage ratios (market and book leverage). Another negative significant correlation is observed between market leverage and firm risk. A positive non-significant correlation is seen in the relationship between firm growth and leverage ratios (market and book leverage).

Table 9. Service sector Correlations

		Profit	Size	Risk	Growth
Booklev	Pearson Correlation	-.374*	.473**	-.177	.126
	Sig. (2-tailed)	.011	.001	.244	.411
	N	45	45	45	45
Marketlev	Pearson Correlation	-.550**	.444**	-.295*	.141
	Sig. (2-tailed)	.000	.002	.049	.355
	N	45	45	45	45

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

7.2.2.6 Correlation Analysis in Investment Sector

In investment sector, the result of Pearson's correlation is presented in the table 10 which shows that there is a negative significant correlation between risk and leverage ratios (market and book leverage). A positive significant correlation is detected between size of the firm and leverage ratios (market and book leverage). A positive non-significant correlation is seen in the relationship between firm growth and leverage ratios (market and book leverage) and between profitability and leverage ratios.

Table 10. Investment sector correlations

		Profit	Size	Risk	Growth
Booklev	Pearson Correlation	.210	.769**	-.665**	.136
	Sig. (2-tailed)	.166	.000	.000	.373
	N	45	45	45	45
Marketlev	Pearson Correlation	.041	.758**	-.480**	.105
	Sig. (2-tailed)	.790	.000	.001	.494
	N	45	45	45	45

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

7.2.2.7 Correlation Analysis Summary

All the results of correlation analysis can be resumed in the following table:

Table 11. Resume of correlation analysis—sectors and stock market Bahrain Bourse

Dependent	Sector	Profit	Size	Risk	Growth
Booklev	**Banking**	N/A	S +	N/A	N/A
	Hotels & Tourism	N/A	N/A	N/A	N/A
	Industrial	N/A	S +	S +	N/A
	Insurance	S-	N/A	S +	N/A
	Investment	N/A	S +	S -	N/A
	Services	S-	S +	N/A	N/A
	Stock Market	S-	S +	N/A	N/A
Marketlev	**Banking**	S-	N/A	N/A	N/A
	Hotels & Tourism	S-	N/A	N/A	N/A
	Industrial	N/A	N/A	N/A	N/A
	Insurance	S -	S +	N/A	N/A
	Investment	N/A	S +	S -	N/A
	Services	S -	S +	S -	N/A
	Stock Market	S -	S +	S +	N/A
S- : A negative significant correlation S +: A positive significant correlation N/A: Non-significant correlation					

It is clear from the table above that there is no significant relationship between growth and leverages in all sectors and market level. For the independent variables: profitability and size, the relationship is significant and it has the same direction (positive, negative respectively) in market level. The risk has significance relationship with market leverage in sectors and market level while this relationship isn't significant at market level with the book leverage.

7.3 Regression Analysis and Hypotheses Test

Regression analysis is carried out in order to test the impact of each independent variable on the dependent variables, and the impact of multiple independent variables on dependent variables. This analysis has been done on market level only. The results of regression analysis are shown in the following discussions.

7.3.1 Profitability Regression Model and Hypotheses Test:

a) Book leverage—Profitability Regression

As it has been previously presented, the regression models profitability capital structure are expressed in the following equations (2) and (3):

$$booklev = \beta 0 + \beta 1\ Profit + \varepsilon \quad (2)$$

and

$$marketlev = \beta 0 + \beta 1\ Profit + \varepsilon \quad (3)$$

Result of regression analysis related to equation (2) is given in table 12, which demonstrates that profitability is negatively related to book leverage with correlation coefficient (R) of (R=47.10%). The coefficient of determination R square equals 22.2% which represents the variation in book leverage explained by variation in the profitability.

Table 12. Book leverage—profitability regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.471[a]	.222	.218	.2761292
a. Predictors: (Constant), Profit				

The coefficient of the equation is given either in table 13 which shows that:

$\beta 0 = 0.569$

$\beta 1 = -2.548$

Table 13. Book value—profitability regression model Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.569	.023		24.477	.000
	Profit	-2.548	.343	-.471	-7.419	.000
a. Dependent Variable: Booklev						

The profitability regression model will be:

$$booklev = 0.569 - 2.548\ Profit \quad (12)$$

It is clear from the model that a change of one unit in profit will lead to a change book leverage by 2.548 in the opposite direction, which reflects strong and negative effect of profitability on book leverage. **This relationship is significant at a level of 5% because sig = 0.**

This result leads to reject H0 profitability book leverage hypothesis (there is no statistical significant impact of profitability on book leverage) and accept H1 book leverage profitability hypothesis (There is statistical significant impact of profitability on book leverage).

b) Market leverage—Profitability Regression

Regarding the market value regression model, table 14 represents the summary analysis

Table 14. Market value- profitability regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.563[a]	.316	.313	.2639386
a. Predictors: (Constant), Profit				

Results of regression analysis demonstrate that profitability is negatively related to market leverage with correlation coefficient (R) of (R=56.3%). The coefficient of determination R square equals 31.6% which represents the variation in market leverage explained by variation in the profitability.

Table 15 shows the coefficient of the equation (3) where:

$\beta 0 = 0.614$

$\beta 1 = -3.103$

Table 15. Market leverage—profitability regression model Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.614	.022		27.664	.000
	Profit	-3.103	.328	-.563	-9.454	.000
a. Dependent Variable: Marketlev						

According to the regression analysis results, the profitability regression model will be:

$$Marketlev = 0.614 - 3.103\ Profit \quad (13)$$

The equation shows that a change of one unit in profit will lead to a change in market leverage by 3.103 in the opposite direction which reflects strong and negative effect of profitability on market leverage. **This relationship is significant at a level of 5% because sig = 0.**

This result leads to reject H0 profitability market leverage hypothesis (there is no statistical significant impact of profitability on market leverage) and to accept H1 market leverage profitability hypothesis (There is statistical significant impact of profitability on market leverage).

7.3.2 Size Regression Model and Hypotheses Test

a) Book leverage—Size Regression

As it has been explained in (4) and (5), the regression models size capital structure are expressed in the following equations:

$$booklev = \beta 0 + \beta 1\ size + \varepsilon \quad (4)$$

and

$$marketlev = \beta 0 + \beta 1\ size + \varepsilon \quad (5)$$

Result of regression analysis related to equation (16) is given in table 16:

Table 16. Book leverage—size regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.763[a]	.583	.580	.2022548
a. Predictors: (Constant), Size				

The Table 16 shows that size is positively related to book leverage with correlation coefficient (R) of (R=76.3%). The coefficient of determination R square equals 58.3% which represents the variation in book leverage explained by variation in the size.

The coefficient of the equation (4) is given either in table 17 which shows that:

β0 = -0.933

β1 = 0.116

Table 17. Book leverage -size regression model Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.933	.087		-10.701	.000
	Size	.116	.007	.763	16.411	.000
a. Dependent Variable: Booklev						

The book value size regression model will be:

$$booklev = -0.933 + 0.116\ Size \quad (14)$$

It is clear from the model that a change of one unit in size will lead to a change book leverage by 0.116 in the same direction which reflects weak and positive effect of size on book leverage. **This relationship is significant at a level of 5% because sig = 0.**

This result leads to reject H0 size-book leverage hypothesis (there is no statistical significant impact of size on book leverage) and to accept H1 size-book leverage hypothesis (There is statistical significant impact of size on book leverage).

b) Market leverage—Size Regression

Regarding the market value regression model, table 18 represents the summary analysis

Table 18. Market leverage—size regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.751[a]	.563	.561	.2109640
a. Predictors: (Constant), Size				

Result of regression analysis demonstrates that size is negatively related to the market leverage with correlation coefficient (R) of (R=75.1%). The coefficient of determination R square equals 56.3% which represents the variation in market leverage explained by variation in the size.

Table 19 shows the coefficient of the equation (5) where:

$\beta 0 = -0.912$

$\beta 1 = -0.116$

Table 19. Market leverage—size regression model Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.912	.091		-10.019	.000
	Size	.116	.007	.751	15.779	.000
a. Dependent Variable: Marketlev						

The size regression model will be:

$$Marketlev = -0.912+0.116Size \quad (15)$$

The equation shows that a change of one unit in size will lead to a change in market leverage by 0.116 in the opposite direction which reflects weak and negative effect of size on the market leverage. **This relationship is significant at a level of 5% because sig = 0.**

This result leads to reject H0 size-market leverage hypothesis (there is no statistical significant impact of size on market leverage) and to accept H1 size-market leverage hypothesis (There is statistical significant impact of size on market leverage).

7.3.3 Growth Regression Model and hypotheses test:

a) Book leverage—growth Regression

Regression models for growth—leverage are expressed in the following equations:

$$booklev = \beta 0 + \beta 1\ growth + \varepsilon \quad (6)$$

and

$$marketlev = \beta 0 + \beta 1\ growth + \varepsilon \quad (7)$$

Result of regression analysis related to equation (6) is given in table 20:

Table 20. Book value—growth regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.091[a]	.008	.003	.3117518
a. Predictors: (Constant), Growth				

Result in the table shows that growth is positively related to book leverage with correlation coefficient (R) of (R=9.1%). The coefficient of determination R square equals 0.8% which represents the variation in book leverage explained by variation in the size.

The coefficient of the equation (6) is given either in table 21 which shows that:

β0 = -0.933

β1 = 0.116

Table 21. Book leverage—growth regression model Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.475	.022		21.143	.000
	Growth	.054	.043	.091	1.263	.208
a. Dependent Variable: Booklev						

The book value growth regression model will be:

$$booklev = 0.475 + 0.054Growth \quad (16)$$

It is clear from the model that a change of one unit in growth will lead to a change book leverage by 0.054 in the same direction which reflects weak and positive effect of growth on book leverage. **This relationship is not significant at a level of 5% because sig = 0.208.**

This result leads to accept H0 growth-book leverage hypothesis (there is no statistical significant impact of growth on book leverage) and to reject H1 growth-book leverage hypothesis (There is statistical significant impact of growth on book leverage).

b) Market leverage—growth Regression

Regarding the market value regression model, table 22 represents the summary analysis

Table 22. Market leverage—growth regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.077[a]	.006	.001	.3182980
a. Predictors: (Constant), Growth				

Result of regression analysis demonstrates that growth is positively related to the market leverage with correlation coefficient (R) of (R=7.7%). The coefficient of determination R square equals 0.6% which represents the variation in market leverage explained by variation in the growth variable.

Table 23 shows the coefficient of the equation (7) where:

$\beta 0 = 0.501$

$\beta 1 = 0.047$

Table 23. Market leverage—growth regression model Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.501	.023		21.858	.000
	Growth	.047	.044	.077	1.076	.283
a. Dependent Variable: Marketlev						

The size regression model will be:

$$Marketlev = 0.501 + 0.047\ Growth \quad (17)$$

The equation shows that a change of one unit in growth will lead to a change in market leverage by 0.047 in the opposite direction which reflects weak and negative effect of growth on market leverage. **This relationship is not significant at a level of 5% because sig = 0.283.**

This result leads to accept H0 growth-market leverage hypothesis (there is no statistical significant impact of growth on market leverage) and to reject H1 growth-market leverage hypothesis (There is statistical significant impact of growth on market leverage).

7.3.4 Risk Regression Model and Hypotheses Test

c) Book leverage—Risk Regression

Regression models for risk—leverage are expressed in the following equations:

$$booklev = \beta 0 + \beta 1\ risk + \varepsilon \quad (8)$$

and

$$marketlev = \beta 0 + \beta 1\ risk + \varepsilon \quad (9)$$

Result of regression analysis related to equation (8) is given in table 24:

Table 24. Book leverage—risk regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.135[a]	.018	.013	.3101917
a. Predictors: (Constant), Risk				

Result in the table shows that Risk is positively related to book leverage with correlation coefficient (R) of (R=13.5%). The coefficient of determination R square equals 1.8% which represents the variation in book leverage explained by variation in the risk.

The coefficient of the equation (8) is given either in table 25 which shows that:

β0 = 0.445

β1 = 0.756

Table 25. Book leverage—risk regression model Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.445	.028		15.601	.000
	Risk	.756	.401	.135	1.886	.061
a. Dependent Variable: Booklev						

The book value risk regression model will be:

$$booklev = 0.445 + 0.756\ Risk \quad (18)$$

It is clear from the model that a change of one unit in risk will lead to a change book leverage by 0.756 in the same direction which reflects weak and positive effect of risk on book leverage. **This relationship is not significant at a level of 5% because sig = 0.061.**

This result leads to accept H0 risk-book leverage hypothesis (there is no statistical significant impact of risk on book leverage) and to reject H1 risk-book leverage hypothesis (There is statistical significant impact of risk on book leverage).

d) Market leverage -risk Regression

Regarding the market value regression model, table 26 represents the summary analysis

Table 26. Market leverage—risk regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.141[a]	.020	.015	.3160617
a. Predictors: (Constant), Risk				

Result of regression analysis demonstrates that risk is positively related to the market leverage with correlation coefficient (R) of (R=14.1%). The coefficient of determination R square equals 2.0 % which represents the variation in market leverage explained by variation in the risk variable.

Table 27 shows the coefficient of the equation (9) where:

$\beta 0 = 0.468$

$\beta 1 = 0.808$

Table 27. Market leverage—risk regression model Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.468	.029		16.125	.000
	Risk	.808	.408	.141	1.979	.049
a. Dependent Variable: Marketlev						

The risk regression model will be:

$$Marketlev = 0.\ 468 + 0.808\ Risk \quad (19)$$

The equation shows that a change of one unit in risk will lead to a change in market leverage by 0.808 in the same direction which reflects weak and positive effect of risk on market leverage. **This relationship is not significant at a level of 5% because sig = 0.061.**

This result leads to accept H0 risk-market leverage hypothesis (there is no statistical significant impact of risk on market leverage) and to reject H1 risk-market leverage hypothesis (There is statistical significant impact of risk on market leverage).

7.3.5 Multiple Regression Model and Hypotheses Test

The Book leverage Multiple Regression model is:

$$booklev = \beta 0 + \beta 1\ Profit + \beta 2\ size + \beta 3\ growth + \beta 4\ risk + \varepsilon \quad (10)$$

The Book leverage Multiple Regression model is:

$$Marketlev = \beta 0 + \beta 1\ Profit + \beta 2\ size + \beta 3\ growth + \beta 4\ risk + \varepsilon \quad (11)$$

a) Book leverage - Multiple Regression Model

Result of regression analysis related to equation (10) is given in table 28:

Table 28. Book value-multi regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.842[a]	.708	.702	.1703725
a. Predictors:(Constant), Growth, Risk, Size, Profit				

Result in the table shows that dependent variables are related to book leverage with correlation coefficient (R) of (R=84.2%). The coefficient of determination R square equals 70.8% which represents the variation in book leverage explained by the variation of independent variables.

The coefficient of the equation (10) is given either in table 29 which shows that:

β0 = -.897

β1 = -1.286

β2 = 0.112

β3 = 0.028

β4 = 1.152

Table 29. Book value-multi regression Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.897	.086		-10.392	.000
	Profit	-1.286	.237	-.238	-5.438	.000
	Size	.112	.006	.740	17.406	.000
	Growth	.028	.024	.047	1.172	.243
	Risk	1.152	.240	.205	4.795	.000
a. Dependent Variable: Booklev						

The book value multi regression model will be:

$$booklev = -0.897 - 1.268\ Profit + 0.112\ size + 0.028\ growth + 1.152\ risk \quad (20)$$

This relationship is significant between dependent variables and independent variables because of sig value which equals 0.00.

This result leads to reject H0 in the multivariable hypothesis (There is no significant impact for profit, size, risk and growth on book leverage ratio) and accept H1 (There is a significant impact for profit, size, risk and growth on book leverage ratio).

b) Market value—Multiple Regression Model

Regarding the market value multiple regression model, table 30 represents the summary analysis

Table 30. Market value-multi regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863[a]	.745	.740	.1623838
a. Predictors:(Constant), Growth, Risk, Size, Profit				

Result in the table shows that dependent variables are related to book leverage with correlation coefficient (R) of (R=86.3%). The coefficient of determination R square equals 74.5% which represents the variation in market leverage explained by variation in the independent variables. The coefficient of the equation (11) is given either in table 31 which shows that:

$\beta 0 = -0.778$

$\beta 1 = -1.941$

$\beta 2 = 0.107$

$\beta 3 = 0.031$

$\beta 4 = 0.967$

Table 31. Market value-multi regression model Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.778	.082		-9.452	.000
	Profit	-1.941	.225	-.352	-8.609	.000
	Size	.107	.006	.692	17.435	.000
	Growth	.031	.023	.050	1.346	.180
	Risk	.967	.229	.169	4.223	.000
a. Dependent Variable: Marketlev						

The market value multi regression model will be:

$$Marketlev = -0.778 - 1.941\ Profit + 0.107\ size + 0.031\ growth + 0.967\ risk \quad (21)$$

This relationship is significant between dependent variables and independent variables because of sig value which equals 0.00.

This result leads to reject H0 in the multivariable hypothesis (There is no significant impact for profit, size, risk and growth on market leverage ratio) and accept H1 (There is a significant impact for profit, size, risk and growth on market leverage ratio).

8. Conclusions

This study examined the determinants of capital structure in a sample of 39 Bahraini companies listed in Bahrain Bourse (stock market). First model of the research demonstrates that profitability of is one of the determinants of firms capital structure (book leverage and market leverage). The coefficient of profitability model is significantly negative, which means that firms with high level of profitability depend on auto financing rather than debt. This result is similar to the findings of (Jensen, 1986) who found that management in highly profitable firms will avoid using debt. It is aligned also with the results of Rajan & Zingales (1995) in USA firms, Rao & Jijo (2001); Pathak (2005); Baral (2004) in Nepal & Mishra (2011) in Indian manufacturing companies, Meero (2015) in GCC banking sector. This result is aligned either with pecking order theory that firm will prioritize using its internal funds. Amidu (2007) in Bangladesh find a significant but positive relationship between profitability and capital structure. Same result has been found by Wahab & Ramli (2014), Acaravci (2015) and Alani & Alamri (2015).

The risk has a weak significant positive effect on the market leverage of the debt ratio and it has non-significant effect on book value of debt. It means risk doesn't affect significantly the capital structure of the firm of the study. This result aligned with findings of Titman & Wessels (1988) who argue that risk (earnings volatility) doesn't appear to be related to the various measures of leverage.

The result shows that growth is not a determinant of capital structure where non-significant relationship has been detected in the study between capital structure variables and growth. This result is similar to the findings of Titman & Wessels, (1988); Chen (2004) and Naim Nasimi (2016).

Size capital structure model shows a positive significant coefficients in both sets of debt ratio (book leverage and market leverage). This result is similar to the findings of Sapienza (2004), Khrawish & Khraiwesh (2010). It is clear from the regression model that significance of this relationship of size with leverages is stronger with market leverage. This may be related to the positive relationship between market value and capacity of borrowing where firms with higher market value than book value have stronger borrowing capacity. Other empirical results align with these findings such as Levent & Ersan (2012), Kumar et al. (2012), Mahvish & Qaisar (2012), Maxwell & Kehinde (2012), Tomak (2013), Wahab & Ramli (2014) and Abdeljawad et al. (2014).

For future research, more independent variables should be included in the study and consider longer period for the collected data. Similar comparative study between Bahrain and other Gulf or regional countries should give more credibility to the results of the research.

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