

HOW FIRM- SPECIFIC CHARACTERISTICS DETERMINE CAPITAL STRUCTURE:

EMPIRICAL EVIDENCE

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Abstract

The purpose of this study is to investigate how firm-specific characteristics determine capital structure as empirical evidence on Jordanian firms listed on Amman exchange market. In which study covers 80 firms (55) manufacturing and (25) service firms for the period (2001 - 2006). The study used ordinary least squares (OLS) regression technique to provide an evidence how firm –specific characteristics presented by tangible assets, size, growth, profitability and risk which is derived from tradeoff and pecking order theories to determine capital structure presented by short term debt ratio, long term debt ratio and total debt ratio. Furthermore, the regression results proved that firm characteristics play important role to determine capital structure.

Key words: firm characteristics, capital structure, Tradeoff theory, Pecking order theory, Jordanian firms,

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كيف تعمل الخصائص المحددة للشركات على تحديد هيكل رأس المال : دليل تجريبي

ملخص الدراسة

تهدف هذه الدراسة إلى معرفة كيف تعمل الخصائص المحددة للشركات الأردنية المدرجة أسماؤها في بورصة عمان خلال السنوات 2001 - 2006 على تحديد هيكل رأس المال . شملت الدراسة (80) شركة من الشركات المدرجة ، منها (55) شركة صناعية، و (25) شركة عاملة في مجال الخدمات . وقد تم استخدام أسلوب الانحدار البسيط لمعرفة كيف تعمل الخصائص المحددة للشركات - كالأصول الملموسة، الحجم، النمو، وربحية الشركة ومخاطرها المشتقة من نظريات المبادلة والتفضيل - على تحديد هيكل رأس المال المتمثل في نسبة الدين قصيرة الأجل، ونسبة الدين طويلة الأجل، ونسبة الدين الكلية. وبعد إجراء تحليل الانحدار أظهرت النتائج أن الخصائص المحددة للشركة تلعب دوراً بارزاً ومهماً في تحديد هيكل رأس المال.

الكلمات الدالة : خصائص الشركات، هيكل رأس المال، نظريات المبادلة، نظريات التفضيل، الشركات الأردنية

1-Introduction

five decades ago many papers and articles examined capital structure concept through constructing many theories .Capital structure theories established through seminar work introduced by Modigliani and Miller (thereafter MM theory) in 1958 .the concept of capital structure means the mix of securities and financing sources like debt and equity used by corporations to finance their real investments (Myers, 2001).Although firms may issue conventional types of complex securities ,such as common stocks and bonds. Every firm attempts to select the best financing sources to achieve the optimal capital structure to maximize its value. This requires from the firm's considering the tradeoff between the cost and benefits of debt. If the firm's use more debt over its need, it will not meet its debt obligations then will face the bankruptcy and incurs the associated penalties (Kraus and Litzenberger, 1973).

In particular , the use of the debt rather than equity funds to finance a given venture may increase the expected return to the owners, but only at the cost of increased dispersion of the outcomes(Modigliani and Miller, 1958). In more recent papers, the practical analysis introduce a factor-analytical technique for estimating the impact of unobservable attributes on the choice of corporate debt ratios (Titman and Wessels, 1988). Some studies examined the possible effect of institutions and agencies as determinants of capital structure (Wald, 1999).

The firm can change its capital structure according to its conditions variations as restrictions to the choice of the internal or external financing to be consistent with the financing policy. Under the market imperfections, firm will attempt to select levels of debt and equity in order to reach an optimal capital structure (Bevan and Danbolt, 2002).

The manager could readjust capital structure right before any investment decision. Management in turn can change capital structure at any time and, in particular, to change capital structure in defense of any challenge (Zweibel, 1996).Whereas capital structures of firms differ among industries. Although there are variations between different companies in the same industry, the variations are minor

inside an industry group than for firms in diverse industries (Ekeroth and Wahlberg, 2006).

Previous studies proved that the firm can determine its capital structure dynamically; specifically, the empirical results relate the firm debt ratio ranges to firm-specific features strongly support the theoretical model of relevant capital structure choice in dynamic setting (Fischer, Heinkel and Zechner, 1989). Some studies analyzed that the firm –specific characteristics as well as macroeconomics factors affect the speed of adjustments towards target leverage (Drobetz, Pensa and Wanzenried, 2006). In addition, the firm can readjust its capital structure periodically toward a target ratio that reflects the costs and benefits of debt financing found in static trade off models (Hovakimian, Opler and Titman, 2001). Most studies investigate the determined capital structure choice, but this study aims to examine how the firm –specific characteristics determine the capital structure in Jordan. This study also seeks to answer the following questions:

- 1) What are the firm-specific characteristics in Jordan firms?
- 2) How the firm –specific characteristics affect the capital structure in Jordan firms?

The remainder of this study is organized as follows: Section 2 discusses the literature review and hypotheses; Section 3 explains the capital structure definitions and measures; Section 4 shows the data, sample, and methodology. While section 5 reports empirical analysis, and section implies conclusion.

2- Literature review and hypotheses

2.1- Review of capital structure theories

Many theories of capital structure were proposed by remarkable theorists, the first theory is tradeoff theory which is based on the balancing between the costs of possible financial distress against the benefits of borrowing (Myers, 1984). This theory is based on tax advantage offered by the debt that the firm's with higher profits should use more debt, Thus substituting debt for equity takes advantage of the interest induced tax shields (Voulgares, Asteriu Agiomirgianakis, 2002). The firm's financing mix determines the states in which the firm earns its debt obligation and receives the tax savings attributable to debt financing (Kraus and Litzenberger, 1973).

Myers, (1984) proposed that financial distress includes the legal and administrative costs of bankruptcy, and reorganization costs. Financial distress implies two qualitative statements about financing

behavior:

1-Risky firm's reduction depends on debt, other things are equal. The higher the variance rate, increases the probability of default on any given package of debt claims.

2-Tangible assets tend to borrow firms more than risky, intangible assets. On the other hand high business risk increases the odds of financial distress; and intangible assets are more likely to lose its value in financial distress.

Under tradeoff theory, debt or leverage increases in profitability of the firm. This reflects that bankruptcy risk is lower when cash flow/profitability increases. An increase in cash flow or profitability which lowers bankruptcy risk should lead to an increase in debt as the firm is better placed to exploit the tax benefit's of interest deductibility (Benito, 2003).

The Second theory is pecking order theory which is established by Myers, (1984), and Majluf (1984)). This theory says that the firm borrows rather than issues equity, when internal cash flow is not sufficient to fund capital expenditures. Thus the amount of debt will reflect the firms cumulative need for external financing (Myers, 2001). Pecking order theory also suggests that the firm starts its financing by issuing the safest security such as debt, then possibly hybrid securities such as convertible bonds, then issuing equity as last resort (Myers, 1984). The pecking order theory is related to asymmetric information which expresses that managers have different information about their firm prospects than investors (Weston and Brigham, 1993).

(Frank and Goyal, 2003) explain the asymmetric information that equity is subject to serious adverse selection problems while debt has only a minor adverse selection problem. From the point of view of an outside investor, equity is strictly riskier than debt. Both have an adverse selection risk premium, but premium is large on equity. Therefore, an outside investor will demand a higher rate of return on equity than on debt. From the perspective of those inside the firm, retained earnings are a better source of funds than debt, and debt is a better deal than equity financing. Accordingly, the firm will fund all projects using retained earnings if possible. If there is an inadequate amount of retained earnings, then debt financing will be used. Thus, for a firm in normal operations, equity will not be used and the financing deficit will match the net debt issues.

A Symmetric information also supports that capital structure varies with firm size. It is argued that the problem of information

asymmetric is quite serve with smaller size and monitoring is either not feasible or very costly .To overcome these problems have to rely heavily on collateral (Voulgares, Asteriu Agiomirgianakis, 2002).

2.2- Firm-specific characteristics

After reviewing the aspects, the theories are related to capital structure, which could derive potential firm-specific characteristics as independent variables from theses theories which include: tangible assets, size of the firm, growth, profitability and business risk, then it explains theses characteristics and determines the direction of their effect on variety capital structure measures as dependent variables.

A-Tangible Assets

Many firms secure its debt borrowed from many sources through tangible assets as fixed assets. These assets play role in determining the levels of debt that firm wants to borrow from lending institution .The important tangible assets are to cover all risks that result from borrowing loans. Titman and Wessels (1988) argued that the type of assets owned by the firm in some way affect the capital structure choice. Rajan and Zingales (1995) proved that the tangible assets are easy to collateralize and thus reduce the agency costs of debt.

Titman and Wessels (1988), Fischer,Heinkel and Zechner (1989), Lee Who, Lee Sun, and Lee Soo (2000), Nguyen and Ramachandran (2006), and Mazur(2007) found the negative relationship between tangible assets and capital structure. Lee Who, Lee Sun, and Lee Soo (2000) explained this relationship in that an increase tangible fixed assets can lead to lowered leverage. If an increase in tangible fixed assets raises a firm bankruptcy costs such as sales costs, the firm leverage could be also lowered. Whereas Rajan and Zingales (1995), Ghosh, Cai and Li (2000), Chen (2004) and Akhtar (2005) confirm a positive relationship between tangible assets and capital structure (debt ratio). This relationship explains that the firms try to hold more tangible assets as collateral to face bankruptcy costs resulting from borrowing debt. Few studies discovered double relationship between tangible assets and capital structure such as Chung (1993), Wijst and Thurik (1993), and Supanvani (2006). These studies found a negative relationship between tangible assets and short –term debt ,also a positive relationship with long-term debt. In this study we will use the total fixed assets, divided total assets as measure of the tangible assets (TANG).

Hypothesis 1a: Tangible assets have a negative correlation with

short term debt ratio.

Hypothesis 1b: Tangible assets have a positive correlation with long term debt ratio

Hypothesis 1c: Tangible assets have a positive correlation with total debt ratio.

B- Size of the Firm

As tangible assets play a role to determine the capital structure, the size of the firm also uses variable to determine capital structure. Small firms may be more leveraged than large firms and may prefer to borrow short-term loans rather than issuing long –term debt because of the lower fixed costs associated with this alternative (Titman and Wessels, 1988). Big firms tend to have diversified activities, which reduce the risk of bankruptcy. Moreover, reputable reasons induce big firms to be more averse to bankruptcy than small firms (Colombo, 2001)

Large firms tend to be more diversified and fail less often, so size may be an inverse proxy for the probability to bankruptcy. If so, size should have a positive impact on the supply of debt. However, size may also be a proxy for the information outside investors have, which should increase their preference for equity relative to debt (Rajan and Zingales, 1995).

To illustrate the previous articles, several results found the relationship between size and capital structure. Titman and Wessels (1988), Fischer, Heinkel and Zechner (1989), Barton and Gordon (1989), Mazur (2007), and Mallikarjunappa and Goveas (2007) identified a negative correlation between size of the firm and capital structure. While , Ozkan (2001), Booth, Aivazian Kunt and Maksimovic (2001), Bevan and Danbolt (2002), Voulgares, Asteriu Agiomirgianakis (2002), Sharma, Kamath and Tuluca (2003) and Tong and Green (2005) found a positive relationship between size of the firm and capital structure. Larger firms have higher borrowing capacity and lower cost of borrowing with better access to capital markets. As a general rule, governments are more prone to protect larger firms and banks lend more capital to these firms than smaller firms (Sayilgen, Karabacak and Küçkkocaoğlu (2006). In this study, it will be used logarithm of total assets as a proxy for size (SIZE).

Hypothesis 2a: Size has a positive correlation with short term debt ratio

Hypothesis 2b: Size has a positive correlation with long term debt ratio.

Hypothesis 2c: Size has a positive correlation with total debt ratio.

C- Growth Opportunities

Every firm in any industries would like to grow its investments to maximize its value. This is required from firms to finance its investments. The firm may finance itself by using external financing like loans and issuing new common stocks or using internal financing such as retained earnings. Titman and Wessels (1988) argued that the cost associated with agency relationship is likely to be higher for firms in growing industries, which have a flexibility choice of the Future investments. Also they noted that growth opportunities in capital assets that add value to a firm. In this case, the firm tries to increase its investments through fixed assets to increase its production then to increase its sales. These need from the firm to choose the best financing to achieve its goals. Chung (1993) suggested that growth of opportunities are capital assets that add value to firm when the firm exists but will disappear should the firm go bankrupt. Hence, bankruptcy costs will be greater for the firm with larger growth opportunities. Since a larger bankruptcy cost implies the lower optimal financial leverage, He observed an inverse empirical association between growth opportunities and financial leverage.

The results of literature review like Titman and Wessels (1988), Lee Who, Lee Sun, and LeeSoo (2000), Ozkan (2001), Voulgares, Asteriu Agiomirgianakis (2002), Chen (2004) Baral (2004), Tong and Green (2005) and Oyesola (2007) revealed a positive relationship between growth opportunities and capital structure. On the other side, Chung (1993), Wald (1999), Ghosh, Cai and Li (2000), Pandey (2004), and Supavanij (2006) found a negative association between growth opportunities and capital structure. The growth opportunities measured as by the percentage change in total assets (GROW).

Hypothesis 3a: Growth has a positive correlation with short term debt ratio.

Hypothesis 3b: Growth has a positive correlation with long term debt ratio.

Hypothesis 3c: Growth has a positive correlation with total debt ratio.

D-Profitability

Modiglianay and Merton (1958) argued that profit maximization is used as variable to determine the choice whether a firm uses debt rather than equity funds to finance a given venture that may well

increase the expected return to the owners. Rajan and Zingales (1995) proved that the profitability is negatively correlated with leverage. In short: dividends and investments are fixed and if debt financing is the dominant mode of external financing, then changes in profitability will be negatively correlated with changes in leverage. Titman and Wessels (1988) discussed that the past profitability of a firm, and hence the amount of earnings available to be retained, should be an important determinant of its current capital structure. Highly profitable firms often use their earnings to pay down debt and, as a result, are usually less levered than their less profitable counterparts (Hovakimian, Opler and Titman, 2001).

Most previous studies gave the same results that there is a negative relationship between profitability and capital structure. Titman and Wessels (1988), Allen and Mizuno (1989), Barton and Gordon (1989), Rajan and Zingales (1995), Wald (1999), Ghosh, Cai and Li (2000), Ozkan (2001), Booth, Aivazian Kunt and Maksimovic (2001), Bevan and Danbolt (2002), Pandey (2004), and Chen (2004). This study used return on assets (ROA) to measure profitability which is calculated as divided earning before interest and tax on total assets (PROF).

Hypothesis 4a: Profitability has a negative correlation with short term debt ratio.

Hypothesis 4b: Profitability has a negative correlation with long term debt ratio.

Hypothesis 4c: Profitability has a negative correlation with total debt ratio.

E-Business Risk

Business risk is define as the uncertainty inherent in projections of future earnings if the firm uses no debt, and it is the single most important determinant of capital structure. (Weston and Brigham, 1993). Myers (1984) discussed risk through cost of financial distress which include the legal and administrative costs of bankruptcy, as well as, subtler agency, moral hazard, monitoring and contracting costs which can erode firm value even if formal default is avoided. Moreover, Kale, Noe and Ramirez (1991) argued that the existence of debt in the capital structure increases the probability of bankruptcy, and firms with more variable cash flows, that is, higher business risk, have a higher probability of bankruptcy for a given level of debt. Jensen, (1986) argued that increase in leverage, the usual agency costs of debt rise, including bankruptcy, and this will reflect on business risk to increase.

Some studies indicate a positive relationship between business risk and capital structure. For instance, Allen and Mizuno (1989), Barton and Gordon (1989), Baral (2004), Nguyen and Ramachandran (2006). Whereas most of literature review found a negative association between business risk and capital structure such as, Bradley, Jarrell and Kim (1984), Titman and Wessels (1988), Balakrishnan and Fox (1993), Wald (1999), Sharma, Kamath and Tuluca (2003), Schoubben and Van Hulle (2004), Pandey (2004) and Chen (2004). In this study, I use the squared difference between profitability and the mean of the profitability to proxy business risk (RISK).

Hypothesis 5a: Business risk has a positive correlation with short term debt ratio.

Hypothesis 5b: Business risk has a negative correlation with long term debt ratio.

Hypothesis 5c: Business risk has a positive correlation with total debt ratio.

3- Capital structure definitions and measures

Many researchers used different measures to proxy the capital structure or leverage. These measures depend on the nature of financial statements (balance sheet and income statement), that's financial statements differ from country to country. In Jordan, the capital structure include short term debt which includes accounts and notes payable, credit bank, short term loans and accruals. Another component of capital structure is long term debt which includes long term loans, corporate bonds and other liabilities. Both of short term debt and long term debt give total debt.

Titman and Wessels (1988) used six measures of financial leverage. They are long term, short term and convertible debt divided by market and by book values of equity. Although, these variables have been combined to extract a common "debt ratio". Rajan and Zingales (1995) suggested the measure of stock leverage that is the ratio of total liabilities to total assets. This ratio does not give a good indication of whether the firm is at risk of default in the near future. Fischer, Heinkel and Zechner (1989) used debt ratio defined as total liabilities divided by the sum of total liabilities and equity market value, another measure of leverage defined as long term liabilities divided by the sum long term liabilities and equity market value. Bowman (1980) had considered four forms to identify the leverage: book value of debt divided to book value of equity, market value of debt divided by market value equity, book value debt divided by

market value equity, and market value debt divided by book value equity.

This study will identify the capital structure measures according to financial statements components. In this case, the following forms of the capital structure to be consider:

Short term debt ratio (SDR) = book value current liabilities divided by book value total assets.

Long term debt ratio (LDR) = book value long term liabilities divided by book value total assets.

Total debt ratio (TDR) = book value total liabilities divided by book value total assets.

4-Data, sample, and the methodology

4.1 -Data and sample

The data of study are collected from financial statements of firm sample. These data derived from annual reports of firms, the guide of companies that issued by Amman stock exchange and other sources. The data covered the period (2001 2006). The sample of study includes manufacturing and service companies listed on Amman stock exchange such as . The study eliminate the financial companies like banks and insurance companies because its characteristics differ from other companies. The selected sample includes 80 companies (55 manufacturing companies and 25 services companies).

4.2 -Methodology

This study tries to test the previous hypotheses through using cross-section regression analysis. This analysis will investigate how the firm-specific characteristics determine capital structure. The general regression model is:

$$Y_{i,t} = \alpha_i + \beta_i X_{i,t} + e_{i,t} \dots\dots\dots \text{Model (1)}$$

$Y_{i,t}$: Leverage of firm i in year t .

α_i : Intercept coefficient of firm i .

β_i : Slope coefficient of independent variables.

$X_{i,t}$: Independent variables of firm i in year t .

$e_{i,t}$: Residual errors of firm i in year t .

In particular, it can convert the general regression model into three multiple regressions models as following:

$$SDR_{i,t} = \alpha_i + \beta_1 Tang_{i,t} + \beta_2 Size_{i,t} + \beta_3 Grow_{i,t} + \beta_4 Prof_{i,t} + \beta_5 Risk_{i,t} + e_{i,t} \dots\dots \text{Model (2)}$$

$$\text{LDR}_{i,t} = \alpha_i + \beta_1 \text{Tang}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Grow}_{i,t} + \beta_4 \text{Prof}_{i,t} + \beta_5 \text{Risk}_{i,t} + e_{i,t} \dots \text{Model (3)}$$

$$\text{TDR}_{i,t} = \alpha_i + \beta_1 \text{Tang}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Grow}_{i,t} + \beta_4 \text{Prof}_{i,t} + \beta_5 \text{Risk}_{i,t} + e_{i,t} \dots \text{Model (4)}$$

Where:

$\text{SDR}_{i,t}$: book value current liabilities divided by book value total assets for firm i in period t

$\text{LDR}_{i,t}$: book value long term liabilities divided by book value total assets for firm i in period t

$\text{TDR}_{i,t}$: book value total liabilities divided by book value total assets for firm i in period t

$\text{Tang}_{i,t}$: the ratio of total fixed assets divided by total assets for firm i in period t

$\text{Size}_{i,t}$: logarithm of total assets for firm i in period t

$\text{Grow}_{i,t}$: the percentage change in total assets for firm i in period t

$\text{Prof}_{i,t}$: the ratio of earning before interest and tax divided by total assets for firm i in period t

$\text{Risk}_{i,t}$: squared difference between profitability in time t and the mean of the profitability for firm i

$e_{i,t}$: Residual errors of firm i in year t

To analysis these regression models, this study will use ordinary least squares (OLS) technique to investigate how does firm characteristics determine capital structure. Also this analysis will estimate the results for service and manufacturing sectors and all sample of study.

5- Empirical analysis

5.1-Descriptive statistics

Table 1 reports descriptive statistics of study variables which include maximum, minimum, mean and standard deviation. The maximum value of short term debt ratio is 1.780(178%), comparing with long term debt ratio valued 59% that means the firms of sample depend on short term financing to finance its short term investments more than long term financing that finance long term investment .Whereas, total debt ratio has 1.7800(178%) as maximum value that similar with short term debt ratio which means that firms did not use long term debt ratio. While the minimum of the short term debt ratio and total debt ratio is 1% approximately. The mean of short term debt ratio (21.94) is larger than long term debt ratio (7.12E-02). It means that the firm uses the short term financing is important more than long term financing to finance in Jordanian firms. The mean of total debt ratio is 31.41% which the firm finance its fixed assets. The

standard deviation of short term debt ratio, long term ratio and total debt ratio are 18.1%, 11.7% and 22.7% respectively.

Table1: Descriptive statistics for the variables (2001-2006)

	SDR	LDR	TDR	TANG	SIZE	GROW	PROf	RISK
Max.	1.780	.59	1.7800	.9732	8.7757	3.3160	.4060	.2509
Min.	.0079	.0000	.0079	.0015	6.0677	-.6520	-.4430	.0001
Mean	.2194	7.12E-02	.3141	.4389	7.1523	9.76E-02	5.79E-02	8.32E-03
Stan.Dev.	.1808	.1169	.2267	.2457	.5781	.2920	9.12E-02	1.91E-02

Notes: SDR(Short term debt ratio): book value current liabilities divided by book value total assets, LDR(long term debt ratio): book value long term liabilities divided by book value total assets, TDR(total debt ratio): book value total liabilities divided by book value total assets, TANG: the ratio of total fixed assets divided by total assets, SIZE: logarithm of total assets, GROW: the percentage change in total assets, PROf: the ratio of earning before interest and tax divided by total assets, RISK(business risk): squared difference between profitability and the mean of the profitability.

To check the other variables, the maximum value of tangible assets ratio is 97.3% whereas the minimum value is .15% . the maximum value refers to high short term debt ratio and long term debt ratio .It means that if the bank lends loans to the firm, it will require from firms to present tangible assets to secure its loans. The mean of tangible assets ratio is 44% and standard deviation is 24.6%.the maximum size of the firm is 8.800 and the minimum is 6.1 .the average size of the firm is 7.2 and the standard deviation is 58.

To check the growth of the firm, it is noticed that the maximum growth percentage is 3.3% and the minimum growth percentage of the firm is -.65%.the mean of growth of the firm is .58% and the standard deviation is 29.2%.However, profitability is ranged from 41% as maximum to -44.3% as minimum. While the average profitability is .57% which indicates the average return derives from operating assets. The standard deviation of profitability is .912%. The high risk of the firm is 26% and the low is .01%.the mean risk of all firms is .0832% and the standard deviation is .019%.

5.2- Correlation Coefficient

Table 2 presents the estimated correlation coefficient between variables .In this section, it will show the correlations between the dependent variables (SDR, LDR and TDR) and independent variables (TANG, SIZE, GROW, PROf and RISK) together. Pearson's correlation coefficient is used for data to explain how specific-firm characteristic determine capital structure.

Table 2: Estimated of correlation coefficients between the variables (2001-2006)

	SDR	LDR	TDR	TANG	SIZE	GROW	PROF	RISK
SDR	1.000							
LDR	-.038	1.000						
TDR	.770***	.490***	1.000					
TANG	-.010	.345***	.180***	1.000				
SIZE	.110**	.210***	.300***	-.075	1.000			
GROW	.180**	-.033	.130***	-.150***	.112**	1.000		
PROF	-.140***	-.257	-.230***	-.307***	.216***	.208***	1.000	
RISK	.050	-.040	.010	-.002	-.097**	-.015	-.146***	1.000

Notes: SDR(Short term debt ratio): book value current liabilities divided by book value total assets, LDR(long term debt ratio): book value long term liabilities divided by book value total assets, TDR(total debt ratio): book value total liabilities divided by book value total assets, TANG: the ratio of total fixed assets divided by total assets, SIZE: logarithm of total assets, GROW: the percentage change in total assets, PROF: the ratio of earning before interest and tax divided by total assets, RISK(business risk): squared difference between profitability and the mean of the profitability.

***, ** indicates the significant coefficient at the 1% and 5% respectively.

We observe that short term debt ratio is negatively correlated with tangible assets ratio but insignificantly. whereas the long term debt ratio and total debt ratio are positively correlated with tangible assets ratio at significance =1%.it indicates that the firm finance its tangible assets by using long term debt .The analysis shows a significant positive relationship between the size of the firm and different capital structure measures (SDR, LDR and TDR).This indicates that if the firm want to expand its size in the market, it will depend on debt to finance its expansion.

The analysis displays that growth is positively correlated with short term debt ratio and total debt ratio at significance 5% and 1% respectively. It means that if the firm wants to grow its assets, it will borrow to finance its growth. While the growth is an insignificant positive associated with long term debt ratio, but it is weakly.

Profitability variable is a significant negative correlated with short term debt ratio and total debt ratio. This indicates that if the firm is more profitable, it will require less debt financing. On the other hand, profitability is an insignificant positive associated with long term debt ratio. Risk is an insignificant positive correlated with short term debt ratio and total debt ratio, and insignificant negative correlated with long term debt ratio.

5.3- Regression Analysis

This section will present the ordinary least squares regression results. It will divide this section to three parts. the first part is to find how service firms characteristics determine capital structure; the second part is to investigate how manufacturing firms characteristics

determine capital structure and the last part examines how all sample firms characteristics determine capital structure.

Table 3 shows the regression results for service firms .the analysis displays that tangible assets is negatively correlated with short term debt ratio (SDR) at significance at 1% and insignificance with total debt ratio (TDR). It means that short term debt is used to finance current assets rather than fixed assets. Moreover, the tangible assets has a positive relationship with long term debt ratio (LDR) at significance 5%. this relationship indicates that if the firm wants to borrow long term debt, it will present tangible assets to secure these debt that is consistent with previous studies like Rajan and Zingales (1995), Ghosh ,Cai and Li (2000), Akhtar (2005), and Chen (2004).

Also the estimation of regression show that the size of the firm has a positive association with three measures of capital structure (SDR, LDR and TDR) at significance 1%. It means that if the firm wants to expand its size, it will increase its debt to increase its size. This results agree with Ozkan (2001), Bevan and Danbolt (2002), Voulgares, Asteriu Agiomirgianakis (2002) and harma, Kamath and Tuluca (2003). The results indicates that growth of firm also a positive correlation with capital structure measures (SDR, LDR and TDR) at significance 1%,5%,1% respectively. This indicates that if the firm tends to growth, it will need the debt and this result is consistent with Titman and Wessels (1988), Lee Who, Lee Sun, and Lee Soo (2000), Chen (2004) , Voulgares,Asteriu Agiomirgianakis (2002), Baral (2004), Ozkan (2001) and Oyesola (2007).

In addition, the regression analysis proves that profitability has a negative relationship with capital structure measures (SDR, LDR and TDR) at significance 1%, 5%, 1% respectively. This means that if the firm achieve high profitability, it will reduce depend on the debt. These results agree with Titman and Wessels (1988), Rajan and Zingales (1995), Ozkan (2001), Bevan and Danbolt(2002), Pandey (2004), Wald(1999and Ghosh,Cai and Li (2000). While the risk that express the business risk has positively correlation with short term debt ratio(SDR) at significance 1%,and insignificance with total debt ratio(TDR).This result show that when the firm increase its business risk ,it will increase its debt. Also the risk has a negative correlation with long term debt ratio, but insignificance.

Furthermore, the results show the adjusted R^2 for SDR, LDR and TDR are 29.4%, 21.2% and 41.6% respectively .these adjusted R^2 indicates the power of independent variables (TANG, SIZE, GROW, PROf and RISK) to explain the dependent variables (SDR, LDR and

TDR). While, the F-statistic also prove the power of adjusted R^2 .

To investigate the second part of analysis, table4, reports regression results for manufacturing firms. Regression results found that tangible assets positively correlated with long term debt ratio (SDR) and total debt ratio (TDR) at significance 1%. As we know that manufacturing sector tend to borrow long term debt to finance its investment, then it will provide more valuable fixed assets to cover its obligations. The results show an insignificant positive correlation between tangible assets and short term debt ratio (SDR).

Regression results also prove that size of the firm a positive correlated with long term debt ratio (LDR) and total debt ratio (TDR) at significance 1%, and insignificance with short term debt ratio (SDR). It indicates that the large firms should be more highly leveraged (Titman and Wessels (1988)). It is consistent with literature review such as, Ozkan (2001), Bevan and Danbolt (2002), Voulgares, Asteriu Agiomirgianakis (2002) and Sharma, Kamath and Tuluca (2003).

To check the growth variable, the analysis displayed a positive association with short term debt ratio (SDR) and long term debt ratio (LDR) at significance 1%. On other hand, the growth has an insignificance negative correlated with long term debt ratio (LDR). Profitability variable has a negative relationship with all capital structure measures (SDR, LDR and TDR) at significance 10%, 1% and 1% respectively. It is consistent with previous studies Titman and Wessels (1988), Rajan and Zingales (1995), Ozkan (2001), Bevan and Danbolt (2002), Pandey (2004), Wald (1999), Ghosh, Cai and Li (2000), and Chen (2004). The analysis shows an insignificant positively relationship between risk and short term debt ratio (SDT). Also the risk has significant a negative association with long term debt ratio (LDR) and insignificance with total debt ratio (TDR). Firms that have high business risk can lower the variability of returns by reducing the level of debt.

Table 3: Estimated OLS regression results of service sector (2001-2006)

Parameter	SDR-Model(2)			LDR-Model(3)			TDR-Model(4)		
	β	t	sig	β	t	sig	β	t	sig
Constant	-.363	-.364	.015	-.336	-4.009	.000	-1.13	-6.17	.000
TANG	-.139	-3.035	.003	5.6E-02	2.174	.031	-4.6E-02	-.824	.411
SIZE	9.1E-02	4.220	.000	5.3E-02	4.630	.000	.210	8.312	.000
GROW	.169	3.571	.000	6.3E-02	2.391	.018	.217	3.710	.000
PROf	-.952	-6.378	.000	-.207	-.204	.015	-1.284	-6.967	.000
RISK	2.013	2.715	.007	-.582	-1.388	.167	.1433	1.565	.120
Adj. R ²	.294			.212			.416		
F-stat.	13.400			9.026			22.21		
No.Obs.	150			150			150		

Notes: SDR(Short term debt ratio): book value current liabilities divided by book value total assets, LDR(long term debt ratio): book value long term liabilities divided by book value total assets, TDR(total debt ratio): book value total liabilities divided by book value total assets, TANG: the ratio of total fixed assets divided by total assets, SIZE: logarithm of total assets, GROW: the percentage change in total assets, PROf: the ratio of earning before interest and tax divided by total assets, RISK(business risk): squared difference between profitability and the mean of the profitability.

Model (3) has higher adjusted R² than model (2) and model (1) which express the strong model. Whereas, F-statistic is supported the strong and significance model (3).

Table 4 shows regression results for pooled sample firms that tangible assets has insignificant negative association with short term debt ratio (SDR) and positive correlated with long term debt ratio (LDR) and total debt ratio at significance 1%. A positive correlation is similar to the some previous studies Rajan and Zingales (1995), Ghosh (2000), Akhtar (2005), and Chen (2004). This result suggest that firms has tangible assets to support its borrowing debt.

Size variable is positively correlated with all capital structure measures (SDR, LDR and TDR) at significance 1% which is consistent with the most literature reviews a (Ozkan 2001), Bevan and Danbolt (2002), Voulgares, Asteriu Agiomirgianakis (2002) and Sharma, Kamath and Tuluca (2003). the explanation this relationship is similar to the previous results. the results display that growth is positively association with short term debt (SDR) and total debt ratio

(TDR) at significance 1%, also insignificance with long term debt ratio (LDR). The results is similar with most previous studies and suggest that if the firms want to grow their assets ,it will use debt to finance their assets.

Table 4: Estimated OLS regression results of manufacturing sector (2001-2006)

Parameter	SDR-Model(2)			LDR-Model(3)			TDR-Model(4)		
	β	t	sig	β	t	sig	β	t	sig
Constant	8.6E-03	.064	.949	-.465	-5.697	.000	-.602	-3.986	.000
TANG	4.0E-02	.873	.384	.213	7.599	.000	.250	4.818	.000
SIZE	2.8E-02	1.49	.135	6.6E-02	5.906	.000	.116	5.581	.000
GROW	.104	3.028	.003	-7.0E-03	-.344	.731	.104	2.729	.007
PROf	-.250	-1.903	.058	-.376	-4.759	.000	-.547	-3.748	.000
RISK	.156	.275	.783	-.684	-2.012	.045	-.194	-.309	.757
Adj. R ²	.031			.267			.174		
F-stat.	3.077			25.011			14.889		
No.Obs.	330			330			330		

Notes:SDR(Short term debt ratio): book value current liabilities divided by book value total assets, LDR(long term debt ratio): book value long term liabilities divided by book value total assets, TDR(total debt ratio): book value total liabilities divided by book value total assets, TANG: the ratio of total fixed assets divided by total assets, SIZE: logarithm of total assets, GROW: the percentage change in total assets, PROF: the ratio of earning before interest and tax divided by total assets, RISK(business risk): squared difference between profitability and the mean of the profitability.

While profitability has a negative relationship with all capital structure measures (SDR, LDR and TDR) at significance 1% which indicates that if firm is more profitable, it will reduce depending on debt. The results reveal that risk is positively correlated with short term debt ratio (SDR) and total debt ratio (TDR), but insignificance. Also it has an insignificance negative correlated with long term debt ratio (TDR). Lower expected business risk; it enables to take on more debt.

To analysis the adjusted R², we notice that model (4) has high adjusted R² equals 22.3%.it express that 22.3% of variation total debt ratio (TDR) is explained by the variation of firm characteristics (tangible assets, size, growth, profitability and business risk). In addition, the value of F-statistic is 28.5 which is express the significance model (4) and support the strong this model. On the other hand, the adjusted R² of model (2) is weaker than other models and

F-statistic prove that's weak.

Table 5: Estimated OLS regression results of pooled sample (2001-2006)

	SDR-Model(2)			LDR-Model(3)			TDR-Model(4)		
Parameter	β	t	sig	β	t	sig	β	t	sig
Constant	-6.8E02	-.673	.501	-.371	-6.080	.000	-.728	-6.195	.000
TANG	-3.05E-02	-.895	.371	.141	6.943	.000	.133	3.388	.001
SIZE	4.3E-02	3.090	.002	5.5E-02	6.619	.000	.142	8.711	.000
GROW	.129	4.607	.000	1.2E-02	.772	.440	.140	4.346	.000
PROf	-.448	-4.709	.000	-.306	-5.390	.000	-.753	-6.863	.000
RISK	.377	.900	.368	-.306	-1.22	.222	.110	.227	.821
Adj. R ²	.080			.215			.223		
F-stat.	9.340			27.243			28.503		
No.Obs.	480			480			480		

Notes:SDR(Short term debt ratio): book value current liabilities divided by book value total assets, LDR(long term debt ratio): book value long term liabilities divided by book value total assets, TDR(total debt ratio): book value total liabilities divided by book value total assets, TANG: the ratio of total fixed assets divided by total assets, SIZE: logarithm of total assets, GROW: the percentage change in total assets, PROf: the ratio of earning before interest and tax divided by total assets, RISK(business risk): squared difference between profitability and the mean of the profitability.

6-Conclusions

This study aims at testing how firm-specific characteristics that presented by tangible assets ,size ,growth, profitability and risk to determine capital structure on a sample of Jordanian firms over the period 2001 to 2006.The sample contains 80 firms between 55 manufacturing firms and 25 service firms. The empirical analysis used descriptive statistics, correlation coefficient and regression analysis. Regression results had divided into three parts: service sector, manufacturing sector and pooled sample.

Empirical results of service firms found that tangible assets are significant negatively correlated with short term debt ratio (SDR) and insignificance with total debt ratio (TDR). Whereas, the tangible assets are positively correlated with long term debt ratio (LDR). In addition, size and growth are positively association with all capital structure measures (SDR.LDR and TDR). while profitability has a significance negative correlated with all capital structure measures (SDR.LDR and TDR). risk has a significance positive relationship with short term debt ratio (SDR), and insignificance with total debt ratio(DTR),but insignificance negative with long term debt ratio (LDR).

Manufacturing firms regression results indicate that the tangible assets and size are related in a significant positive way with long term debt ratio (LDR) and total debt ratio (TDR), but insignificant with short term debt ratio (SDR). growth is positively correlated with short term debt ratio (SDR) and total debt ratio (TDR) at significance 1%, but it is a negative correlated with long term debt ratio (LDR). risk has a positive insignificance associated with short term debt ratio (SDR) , and is negatively significance with long term debt ratio (LDR), but insignificance with total debt ratio (TDR).

The regression results of pooled sample found that the tangible assets is positively relationship with long term debt ratio (LDR) and total debt ratio (TDR) at significance 1%, but a negative insignificance with short term debt ratio (SDR). Moreover, size and growth have a positive significance correlated with all capital structure measures accept relation between growth and long term debt ratio (LDR) which is insignificant. Profitability is positively associated with all capital structure measures (SDR, LDR and TDR) at significance 1%. risk has a positive insignificance with short term debt ratio (SDR) and total debt ratio (TDR). Whereas, risk is related a negative insignificance with long term debt ratio (LDR).

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