Study on Determinants of Capital Structure in the Pharmaceutical Industry of Pakistan

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Abstract

This study aims to investigate the determinants of capital structure in the pharmaceutical industry of Pakistan and to explore which capital structure theory is more relevant to pharmaceutical companies in Pakistan. It uses secondary audited accounting data about seven pharmaceutical companies out of twelve companies listed on the Pakistan Stock Exchange (PSX) covering 10 years from 2012 to 2021(both inclusive). This study aims to expand the existing boundary of knowledge on capital structures in this particular sector, as there is very little information available about capital structure in this sector in Pakistan. Using pooled data and ordinary least square fixed effect model the findings are: operating leverage, the firm's specialty, return on asset, and tax rates were significant determinants of capital structure, whereas the size of the firm, growth rate, basic earning power, fixed charges coverage ratio, and liquidity have very little or insignificant influence on the capital structure of Pakistani pharmaceutical companies during the period under study. The research also concluded that pharmaceutical companies are more aligned with MM proposition II (With Corporate Tax) and Trade-off theory. The limitation is that very few companies are quoted on Pakistan Stock Exchange (PSX).

Keywords: *Regression analysis, correlation, capital structure, listed companies, leverage, corporate finance.*

Introduction

The pharmaceutical industry in Pakistan is important both in terms of its nature and investment. More than 750 pharmaceutical companies are involved in the Production of different pharmaceutical products. Some of the companies are much larger compared to others, because, mergers and acquisitions were very common phenomena in this industry in the recent past. Some companies are market leaders because of their sizes,   presently top fifty companies possess about 90% of the market share in this industry. Out of such a large number of companies involved in drug manufacturing, only twelve are listed on Pakistan Stock Exchange (PSX). Not all of them are included in this study because of the unavailability of data for all ten years to avoid an unbalanced panel. Seventeen multinational companies are operating here but only six to seven are actively involved in the productive activity, others have outsourced their production to smaller companies operating locally in the private sector. This is a highly regulated industry because of the sensitivity of its nature of products, yet, over-the-counter selling of counterfeit products is a major problem faced by the healthcare sector in Pakistan.

Background of the study

Capital structure is the ratio in which a firm's assets are financed, through different sources (financial securities) shown on the right-hand side of the balance sheet. The choice of Capital structure is a dynamic process, every time a firm needs funds, the financial managers try to be very prudent so that their financing decision adds value to the firm and an optimal mix is selected(planned debt-equity mix) which will optimize the value of the firm. Leverage is defined as the ratio of debt and equity which shows a relationship between the funds supplied by the creditors and the owners' supplied funds.

Researchers in corporate finance have developed many theories identifying the functional relationship between the value of the firm and its debt-equity ratio. The preexisting capital structure theory however began in 1958, when Modigliani and Miller wrote their paper in the American Economic Review in June 1958, ("The Cost of Capital Corporation Finance and the Theory of Investment "). Each of these two scholars won a Nobel prize for their contribution to this field of corporate finance. This paper contained the most forceful argument ever advanced in the field of finance. Capital structure was considered as a complex issue by finance managers

until the publication of MM's paper, which motivated other researchers also to explore how financing decisions affect the firm's value.

A large body of related research therefore surfaced. The most outstanding work however remained the trade-off theory (TOT) (Kraus and Lichtenberger, 1973) and the pecking order framework (POF) (Myers, 1984).

Assuming an efficient capital market, under very restrictive conditions MM proved that it does not matter how companies finance their assets because an individual investor can replicate what managers do for the corporate firms by employing debt into its capital structure through homemade leverage. This idea changed the thinking of the entire financial world which resulted in the development of new securities like options and other derivatives.

MM were aware that, their paper has presented an over-simplistic view of reality, and a correction in terms of relaxation of some of the assumptions is necessary. Later on, in 1963 they wrote a correction paper incorporating corporate tax into their model ("Corporate Income Tax and Cost of Capital: A Correction"), with this relaxation they showed that (because of the before-tax deductibility of interest expense) value of a levered firm is greater than the value of an identical zero debt firm exactly by applicable corporate tax rate multiplied by the amount of debt utilized by the levered company. This proved that the financing decision matters and debt financing is a value-addition strategy.

In developed capital markets studies on determinants of capital structure have been carried out by Bradley, Jarrell & Kim. 1984; Titman & Wessels, (1988); Allen & Mizuno, (1989), Lord and Farr, 2003). Roden (1995) found that debt and profitability are positively related. Hadlock and James (2002) discovered that companies prefer debt financing because it increases profitability. Abor and Biekpe (2005) found that debt and profitability are positively related. Kester (1986) however found a negative relationship between organization's performance and its capital structure. Not much work on the capital structure has been done in Pakistan. Some Indian researchers,   like Bhat and Kumar (1980), Rasoolpur (2012), Bhaduri (2002), and many others have conducted research on Indian capital markets. The contradictory relationship between the capital structure and various variables like liquidity, growth opportunity, size, depreciation tax shield, etc. encouraged to conduct empirical analysis on the determinants of capital structure in

the pharmaceutical industry of Pakistan. This study hopes to expand the existing boundary of knowledge on capital structures in the pharmaceutical sector of Pakistan.

Objectives of the study

The purpose of this empirical study is to identify the determinants of capital structure in the pharmaceutical industry of Pakistan, as also, how pharmaceutical companies make financing decisions. In this study, the ratio of the amount of capital supplied by the creditors to the amount contributed by the owners is used to measure the capital structure. The debt market (primary) in Pakistan is not developed and as such companies mostly rely on inter-firm borrowing and/ or bank borrowing for all kinds of debt financings.

Research Questions

 The study attempts to answer two questions:

1) To what extent the determinants of capital structure assumed in this study are related to the presently reported capital structure in the pharmaceutical industry of Pakistan?
2) Which capital structure theory is more relevant to pharmaceutical companies in Pakistan?

Literature Review

Every time when funds are needed by a firm, the finance managers have to weigh the cost and benefit of each type of fund so as to avoid value destruction options. The capital structure decision, therefore, becomes extremely important because this choice determines the minimum rate of return a firm must earn called, the weighted average Cost of Capital (WACC). This is the necessarily required rate of return a firm must earn to pay to its investors to keep them invested. Firms try to keep their WACC as low as possible and strive for value maximization options. Diana et al. (2016) showed that optimal capital structure maximizes the share value through a balance between risk and return.

Various studies have used different variables as determinants of capital structure. A preferred capital structure (targeted capital structure) is a value maximizer for a firm. Theories attempt to discuss the impacts of various sources of funds on the value of the firm.

The MM models were pioneering because they encouraged later researches as to the selection of technique and methodology. Also, the unrealistic assumptions by MM allowed researchers to

modify the MM models by removing some of the assumptions. What follows describes some noticeable developments in financing decision theory.

Trade-Off Theory

This theory takes into account the additional bankruptcy ("financial crunch'') and agency cost to MM and/or Miller's model, as a trade-off to obtaining an optimal capital structure i.e. employing debt as a source of financing continues to add value to the firm until a threshold level, below which the chance of bankruptcy is minuscule. Beyond this point, the bankruptcy cost becomes increasingly significant and reduces the tax benefit of debt, if further debt is added to this debt level, the expected bankruptcy-related cost will exceed the tax benefits of debt and the value of the firm will decline to result into reduction in share price in the capital markets. De Angelo, H. (2022) argues that managers do not have sufficient knowledge to optimize the capital structure with any real precision. This paper identifies the conceptual sources of the main empirical failure of some well-known models of capital structure by taking into account imperfect managerial knowledge and various other factors.

Signaling Theory

The theory assumes asymmetry of information. Insider (Finance Managers) have more accurate projections about the future prospects of the firm than marginal equity investors and managers will issue new shares when they are overpriced, making equity issue a negative signal, whereas debt issue signals a brighter future prospect for the firm.

The Pecking Order Theory

The incidence of issuance cost and asymmetry of information puts finance managers to a defensive strategy for financing, new investment opportunities through a preferred sequence of financing, first being retained earnings, followed by debt, and finally new common stock.

Reserve Borrowing Capacity

Companies position themselves to take advantage of futuristic money-making investment opportunities by keeping reserve borrowing capacity to avoid a negative signal of new stock issues. This theory advocates that managers purposely keep the value of the firm sub-optimal to pass on an advantage to existing stockholders for any high-profit investment opportunity expected in the future.

The Market Timing Theory

This theory assumes that the firm will issue stocks when they estimate that security is overpriced in the market than the intrinsic value and resort to debt issues when they think that interest rates are somewhat low. In other words, they try to time the market. Michael J. Barclay and Clifford W. Smith Jr. ("The Capital Structure Puzzle: Another look at the Evidence", "Journal of Applied Corporate Finance 1999").

Research Methodology

Model

Pharmaceutical companies and debt employment: To estimate the effect of each of the exploratory variables while raising debt in the pharmaceutical industry of Pakistan.

Data source

The sample contains cross-sectional and time series data for each company included in this study. Companies have been picked on the basis of the availability of complete accounting records from 2012 to 2021, ten years for all the variables for each firm. This study is an exploratory effort, limited to only seven companies out of the twelve pharmaceutical companies listed on the Pakistan Stock Exchange (PSX) covering a ten-year period from 2012 to 2021 (both inclusive). Although a large number of pharmaceutical companies about 750 are operating either as private limited or family-owned companies.. This study has used accounting data published in the annual reports of these firms. Data for some of the exploratory variables like operating leverage, growth, size, etc. have however been worked out from the published accounting statements.

Selection of Regression Model

Correlation, multiple regression analysis, and fixed effects approach to panel data are used to explore the determinants of capital structure in the pharmaceutical industry of Pakistan. Also t-test has been applied to ascertain the reliability of regression coefficients. Also, the Durbin Watson test has been used to detect serial correlation and multicollinearity among the explanatory variables. This approach is usually used by researchers to determine the interdependency between capital structure and different independent variables. Panel data absorbs the effects of missing or unobserved variables. The results of panel data findings provide

more forceful effects of the dependent variable and independent variables than cross-sectional or time series data. By lumping together different pharmaceutical companies' heterogeneity or uniqueness that may exist among the firms is controlled. The panel data gives more information, more variability, more degrees of freedom (because of the sufficiently large size of data) and more efficiency than time series or cross-sectional data implying that the uniqueness of the firm is taken care of in it.

Regression Model

D/Eit = B0 + B1 size + B2 growth+ B3 liquidity +B4 DPOR + B5 specialty + B6 basic earning power + B7 fixed charges coverage ratio + B8 non debt tax shield + B9 operating leverage + B10 tax + B11 return on asset + Uit

D/Eit = β0+ ∑ βi.Xit+ Uit

D/E = creditors' supplied fund to owners' equity ratio (capital structure)

B0=constant or intercept term

Xit= Explanatory variables (determinants of capital structure)

Bi= the calculated Coefficients of determinants of capital structure.

Uit= Random error term

i= exploratory variables

t= time period under study

Hypotheses

Null Hypotheses

H01: Firm's capital structure and size are not significantly related.

H02: Firm's growth rate and capital structure are not significantly related.

H03: Firm's liquidity and capital structure are not significantly related.

H04: Firm's dividend payout ratio and capital structure are not significantly related.

H05: Firm's specialty and capital structure are not significantly related.

H06: Firm's basic earning power is not significantly related to capital structure.

H07: Firm's fixed charges coverage ratio is not significantly related to capital structure.

H08: Firm's (DEP/TA) non-debt tax shield and capital structure are not significantly related.

H09: Firm's operating leverage and capital structure are not significantly related.

H10: Firm's tax rate and capital structure are not significantly related.

H11: Firm's ROA and capital structure are not significantly related.

H12: Firm's Tangibility and capital structure are not significantly related

Alternate Hypothesis

Ha: The above-mentioned variables are significantly related to the dependent variable (Leverage) for the companies under study.

Variables and their Definitions

Debt to Equity (leverage) Ratio

This financial ratio indicates for one unit of investment in the firm by the owners, how many units of debt have been raised by the firm (Creditors supplied fund/Owners supplied fund).   The weighted average cost of capital declines if a cheap source of debt is used to finance projects/ long-term assets, a value-added option. A high quotient of this ratio indicates high risk. Uger, M., Solomon, E (2022), and others in the group found that long-term debt is a stronger disciplining device compared to short-term debt and financial distress predictor.

Size

The study of previous researches indicates that different researchers have used different methods to measure corporate size. Titman & Wessels (1988) used logarithms of sales while Bhaduri (2002) used logarithms of total assets to measure the size of a firm, others used the absolute value of sales or total assets for determining the size of the firm. Titman (1988) used employment and Wessels (1988) used employees' turn- over rate for measuring the corporate size. In this study logarithms of total assets have been calculated to measure the size of the firm. It is a common perception that a large or well-established firm can afford to have a larger amount

of debt (than a small firm), smaller firms because of their size don't have the same ease of access to financial markets as larger firms have.

Growth

Growth in the asset on year to year basis is considered as a measure of yearly growth in this paper and is calculated as:

[(Assets t) - (Assets t-1)] / Assets t-1

The annual compounded growth rate of assets over the period of study could also be taken as a proxy for growth rate.

According to financing preference theory, firms tend to use internally generated funds (Retained earnings) as a first option, the next preferred choice is the debt which is mostly rightly priced. The evidence from earlier researches is mixed as to the relationship between capital structure and growth. External equity issuance is the last choice. Some researchers have also used a ratio of capital expenditure and total assets as a measure of growth.

Liquidity

Liquidity is the easiness of a firm to convert assets into cash to meet its immediate liabilities as and when needed. Liquidity is important for the very survival of the firm. Liquidity is evaluated by the resultant quotient of total current assets and total current liability of a firm. The inability of a firm to meet its current liabilities may pose a threat of insolvency for the firm and force the firm to borrow short-term or in some cases even long-term to finance its inventories to avoid stock outs and make payments to suppliers and short-term creditors.

Dividend Payout Ratio

The firms with a larger amount of fixed cost run a high risk if it is coupled with a high level of debt and may have less to payout to their stockholders in case the firm is facing earning volatility. The dividend policy of the firm gives the expectation of the top management regarding the volatility of future earnings. It is expected that a firm that intends to pay higher dividends will keep leverage at a lower level. The dividend payout ratio is found by dividing declared dividends by net earnings. In this study, it is found by the ratio of (DPS/EPS) dividend per share by earnings per share, for the firm for a particular year.

Firm's Specialty

This refers to a difference created by the firm through R&D, employees' talent, supply chain management, marketing effort, and innovative products and services. Researchers have found an opposite (inverse) relationship between this specialty and leverage. In this study the selling cost dived by sales is used to measure management quality. High-quality management is assumed to generate larger cash flows from operations and as such can afford to have a larger percentage of debt in its capital structure.

Basic Earning Power

It indicates the firm's raw earning potential of the assets before the incident of tax and interest expense. It also indicates how efficiently managers have utilized the available asset to earn this income before interest and taxes. In this study, it is measured by (EBIT/ TA) which is the ratio of earnings before interest and taxes and total assets employed by the firm in generating this income.

Fixed Charges Coverage Ratio

This variable indicates how well a firm is doing to cover its fixed charges (interest and depreciation and amortization). In this study, it is measured by (EBITDA/TA) income before interest, tax, depreciation, and amortization. This ratio is more important than earning rate as it includes all fixed charges and as such is a more robust measure of fixed charges compared to interest charges only.

Non-Debt Tax Shield

This paper measures this variable by (DEP /TA) depreciation expense divided by the total assets. Firms use depreciation as an expense and can save tax on depreciation expense which is a noncash expense for the firm. It is therefore expected that the firm having a larger non-debt tax shield would employ a lesser amount of debt into its capital structure. Fama and French (2002) also used this ratio in their study.

Operating Leverage

The amount of fixed costs embedded in a firm's total cost, if a high percentage of the cost is fixed, the company is considered to have a high degree of Operating Leverage. This operating leverage affects firms operating profits i.e. EBIT. An operating leverage can be thought of as, for

a 1% change in sales, impacts in how much percentage change in the income before interest and taxes (EBIT). High (DOL) is generally observed in (i) highly automated, capital-intensive firms; (ii) business keeping highly skilled workers who must be retained and paid even when sales are low: and (iii) firms involved in ambitious product development, must retain and pay to these specialists to complete ongoing R&D projects. This study has used a traditional definition, i.e. for a 1% change in sales what is the % change in the income before interest and taxes. Interest being fixed expense indicates risk in borrowing for a high DOL firm.

$$[(EBIT\ t) - (EBIT\ t\text{-}1)]\ /EBIT\ t\text{-}1\ /\ [(Sales\ t) - (Sales\ t\text{-}1)]\ /Sales\ t\text{-}1 = DOL$$

Tax Rate

Tax is the cost of doing business for the firm and affects its WACC and value of the firm. It is expected that the tax rate may have a favorable effect on the capital structure decision. In this study tax rate (where not specified) is calculated as a ratio of tax expenditure divided by income before tax i.e. (Tax / EBT).

Return on Total Assets

This ratio indicates for one rupee of investment in the total assets how many paisas were made available to the owners of the firm. It is calculated by dividing net income by total assets available to the firm. (NI/TA), Hovakimian (2004) found a negative relationship between leverage and return on assets.

Tangibility

How much of the total asset is fixed asset for the firm, i.e how capital intensive the firm is? Firms with high income volatility is expected to employ lesser debt into its capital structure. This variable is a ratio of fixed asset to total asset (FA /TA)

Empirical Results

Table 1

Correlation Matrix.

	CAP	BEP	TAX	TAN	SIZ	LIQ	SPE	DPO	FCC	GRO	NTD	OPL	ROA
CAP	1.0000												
BEP	-0.4765	1.0000											
TAX	-0.4756	0.2886	1.0000										
TAN	-0.0251	-0.1782	0.0698	1.0000									
SIZ	-0.2923	0.2533	0.1569	0.2937	1.0000								
LIQ	-0.3486	0.5356	0.0881	0.0460	0.7095	1.0000							
SPE	0.3469	-0.5270	-0.1761	0.2459	-0.6506	-0.6631	1.0000						
DPO	-0.2437	0.0311	0.0632	0.2696	0.1103	0.1699	0.0195	1.0000					
FCC	-0.4463	0.9800	0.2867	-0.1520	0.2510	0.5263	-0.5211	0.0348	1.0000				
GRO	-0.2265	0.1947	-0.1716	-0.3144	0.1879	0.1859	-0.3664	-0.1051	0.1422	1.0000			
NTD	0.4046	-0.4259	-0.0540	0.3897	-0.2865	-0.4249	0.5535	-0.0224	-0.2972	-0.5690	1.0000		
OPL	-0.5501	0.1561	0.0532	-0.0674	0.0960	0.0945	-0.2289	0.0354	0.1218	0.4872	-0.2943	1.0000	
ROA	-0.4592	0.9390	0.1900	-0.2034	0.4363	0.6592	-0.6548	0.0176	0.9402	0.2548	-0.4394	0.1628	1.0000

Table 2
Determinants of capital Structure, Debt to Equity is Regress and
Regression fixed effect Firm Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.447148	40.84180	-0.108887	0.9137
BEP	26.34940	70.17718	0.375470	0.7089
DPO	-4.646448	1.958191	-2.372827	0.0215
FCC	-41.83097	68.96236	-0.606577	0.5468
GRO	7.324190	9.367730	0.781853	0.4379
LIQ	-0.338364	1.439211	-0.235104	0.8151
NTD	237.8559	207.2200	1.147842	0.2564
OPL	-0.145508	0.027610	-5.270071	0.0000
ROA	-31.41675	43.93633	-0.715052	0.4778
SIZ	6.812388	4.984742	1.366648	0.1777
SPE	-53.25874	18.88388	-2.820328	0.0068
TAN	-6.445907	13.98309	-0.460979	0.6468
TAX	-24.01681	6.164132	-3.896219	0.0003

Table3
Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.731833	Mean dependent var	2.889371
Adjusted R-squared	0.637186	S.D. dependent var	9.926695
S.E. of regression	5.979247	Akaike info criterion	6.640654
Sum squared resid	1823.321	Schwarz criterion	7.250960
Log likelihood	-213.4229	Hannan-Quinn criter.	6.883075
F-statistic	7.732240	Durbin-Watson stat	2.281152
Prob(F-statistic)	0.000000		

Discussion and Analysis

Table 1 shows the correlation of exploratory variables for the period 2012 to 2021. All the values are not very significant or less than 0.55 with the exception of between ROA and other variables which indicates there is no serious issue of multicollinearity in this case. Only non-debt tax shield, firm's specialty, and tangibility are positively related to the capital structure, all other variables are negatively correlated to the capital structure but the strength of the relationship is low in all the cases.

Size

Size has a positive coefficient of correlation which is significant at 6.812388. However the t-value is 1.36648 and a p-value of 0.17777, this indicates that size is not an accurate exploratory variable of leverage in this study. This variable was selected on the basis of Rajan and Zingales (1995) argument that there is less asymmetry of information regarding the large-size firm and as such, it is less probable that share may be mispriced. Also, Titmanan and Wessels (1988) argue that large-size firms have less probability of bankruptcy, and would employ more debt into their capital structure. Maybe because of the weak legal system in Pakistan, companies are very fearful of bankruptcy threats. Hence size may not be a determinant of the capital structure of the firm. The null hypothesis number1 is therefore accepted. Chandha, S., & Seth (2021) found size as a significant factor in Indian manufacturing firms

Growth

The correlation between growth and capital structure is -0.2265, the regression coefficient is 7.324190, the t-value is 0.781853 and a p-value of0.4379 which is not significant, the null hypothesis number 2 is also accepted. The empirical evidence of the relationship between capital structure and growth rate is somewhat mixed. Bevan & Danbolt (2002) and Ozkan (2002) found a significant negative relationship between growth and leverage. Some other researches have however found a positive relationship. Chandha (2021) found growth as a significant variable.

Liquidity

The correlation between capital structure and liquidity is documented as (-0.3486) which is an insignificant negative correlation, the p-value is however 0.8151, and the null hypothesis number 3 is therefore accepted. This study did not find a significant relationship with liquidity. Some researchers have found a positive relationship between liquidity and capital structure. Rasoolpur(2012) found liquidity as significant for Indian manufacturing sector.

Firm's Specialty

It is documented that specialty has a positive correlation with capital structure (0.3469), the t-value is -2.820328, and the p-value however is 0.0068 which is significant. The null hypothesis number 4 is therefore rejected. These results show that there is a strong relationship between a firm's specialty and leverage. This result is consistent with the research work of other researchers like Titman and Wessels (1988) and Bhaduri (2002). Firms that manage their costs at a lower level prefer to keep more debt in their capital structure. Rasoolpur (2012) also found this variable as a significant determinant of capital structure in the Indian manufacturing industry.

Basic Earning Power

There is a negative but insignificant (-0.4765) correlation between BEP and capital structure, a p-value of 0.7089, the null hypothesis number 5 is thus accepted. Similar results were reported by many other researchers who argue that good profitability reduces the need for external borrowing. Chandha (2021) found profitability, a significant variable in explaining financial leverage.

Fixed Charges Coverage Ratio

The correlation between fixed charges coverage ratio and capital structure is insignificant (-0.4463), and the p-value is 0.5468; the null hypothesis number 6 is therefore accepted.

Dividend Payout Ratio

The purpose for choosing this variable was to judge the effect of, how dividend policy influences the financing decision in terms of payment of dividends to stockholders. It is expected that the firms giving high dividends will employ a lesser percentage of creditors' supplied funds. Regression results indicate that at a 5% level of significance, this variable is significant, null hypothesis number 7, is therefore rejected.

Non-Debt Tax Shield

A positive correlation (0.4046) is documented between this variable and leverage, a beta coefficient of 237.8559 with a p-value of 0.2564, and as such null hypothesis number 8 is accepted.

Operating Leverage

A negative correlation (-0.5501) between operating leverage and capital structure and a beta coefficient of -0.145508 is noticed with a t-value of -5.27001. This variable is highly significant to capital structure and as such null hypothesis, number 9 is rejected. This confirms the general assumption that high-risk firms do not keep high levels of debt in their capital structure.

Return on Assets

The correlation between return on assets and capital structure is -0.4592 and a beta coefficient of -31.41675 with a probability of 0.4778, and as such the null hypothesis number 10 is accepted. Habibniya (2022) also found ROA as a significant predictor of capital structure.

Tax Rate

The correlation between tax rate and capital structure is -0.4756 and the beta coefficient of -24.01681, this variable is significant at less than 1% level of significance which confirms MM's second deduction that tax rate matters in the firm's valuation. The null hypothesis number 11 is therefore rejected.

Tangibility

Table 1 indicates a negative insignificant(-0.0251) relationship between capital structure and tangibility and a beta coefficient of -6.445907, with a p value of 0.6448 and as such the null hypothesis number 12 is accepted.

Conclusion

Researchers in corporate finance have a great inclination toward exploring the determinants of capital structure as an important subject of study. This study is a pioneering endeavor in Pakistan to explore how the managers in the pharmaceutical industry of Pakistan select a particular option for financing the capital requirements for their firms. It is identified that operating leverage, firm's specialty (uniqueness), dividend payout ratio and tax rate were significant exploratory variables as the determinant of capital structure in this study for this data for the period 2012 to 2021. Seven other probable exploratory variables were found insignificant. The limitation of the study is that 759 pharmaceutical companies are operating in Pakistan, 17 of them are MNCs while others are local (Pakistani) firms, some of which are involved in only the marketing of pharmaceutical products. Only 12 companies are listed on the PSX. Audited accounting data for all 10 years is available for seven companies only, which are all included in this study, the study, therefore, covers a small segment of the total industry. If reliable data from other companies were also available, the results could have been different in terms of the significance of some of the exploratory variables.

References

Abor, J., &Biekpe, N. (2005). What determines the capital structure of listed firms in Ghana?. *African Finance Journal*, *7*(1), 37-48.

Allen, D. E., & Mizuno, H. (1989). The determinants of corporate capital structure: Japanese evidence. *Applied Economics*, *21*(5), 569-585.

Bhat, Ramesh K. (1980). Determinants of Financial Leverage : Some Further Evidence. Chartered Accountant 29: 451-456.

Bradley, M., Jarrell, G. A., & Kim, E. H. (1984). On the existence of an optimal capital structure: Theory and evidence. *The Journal of Finance*, *39*(3), 857-878.

Barclay, M. J., & Smith Jr, C. W. (1999). The capital structure puzzle: another look at the evidence. *Journal of applied corporate finance*, *12*(1), 8-20.

Bhaduri, S. N. (2002). Determinants of capital structure choice: a study of the Indian corporate sector. *Applied financial economics*, *12*(9), 655-665.

Bevan, A. A., &Danbolt, J. (2002). Capital structure and its determinants in the UK-a decompositional analysis. *Applied financial economics*, *12*(3), 159-170.

Chadha, S., & Seth, H. (2021). Ownership structure and capital structure: a panel data study. *International Journal of Business Innovation and Research*, *24*(3), 385-396.

Diana, C., Loan, B., & Alexandra, B. (2016). Influence of the capital structure on the company's performance: Study of the energy sector companies listed on BSE. *The Annals of the University of Oradea*, (1040).

DeAngelo, H. (2022). The capital structure puzzle: what are we missing? *Journal of Financial and Quantitative Analysis*, *57*(2), 413-454.

Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of financial studies*, 1-33.

Habibniya, H., Dsouza, S., Rabbani, M. R., Nawaz, N., & Demiraj, R. (2022). Impact of capital structure on profitability: panel data evidence of the telecom industry in the United States. *Risks*, *10*(8), 157.

Hovakimian, A., Hovakimian, G., &Tehranian, H. (2004). Determinants of target capital structure: The case of dual debt and equity issues. *Journal of financial economics*, *71*(3), 517-540.

Hadlock, C. J., & James, C. M. (2002). Do banks provide financial slack? *The Journal of Finance*, *57*(3), 1383-1419.

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The journal of finance*, *28*(4), 911-922.

Kester, W. C. (1986). Capital and ownership structure: A comparison of United States and Japanese manufacturing corporations. *Financial management*, 5-16.

Lord, R. A., & Farr, W. K. (2003). Collusion and financial leverage: an analysis of the integrated mill steel industry. *Financial Management*, 127-148.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, *48*(3), 261-297.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, *13*(2), 187-221.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review*, *53*(3), 433-443.

Ozkan, A. (2002). The determinants of corporate debt maturity: evidence from UK firms. *Applied Financial Economics*, *12*(1), 19-24.

Rajan, R. G., &Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance*, *50*(5), 1421-1460.

Rasoolpur, G. S. (2012). An empirical analysis of capital structure determinants: evidence from the Indian corporate sector. *International Journal of Management & Information Technology*, *1*(3), 1-12.

Roden, D. M., &Lewellen, W. G. (1995). Corporate capital structure decisions: evidence from leveraged buyouts. *Financial Management*, 76-87.

Titman, S., &Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance*, *43*(1), 1-19.

Ugur, M., Solomon, E., &Zeynalov, A. (2022). Leverage, competition and financial distress hazard: Implications for capital structure in the presence of agency costs. *Economic Modelling*, *108*, 105740.