CAPITAL STRUCTURE AND FINANCIAL PERFORMANCE: CASE STUDY FROM PAKISTAN PHARMACEUTICAL SECTOR

Muhammad REHAN, PhD Scholar*

Süleyman Serdar KARACA, PhD**

Jahanzaib ALVI, PhD Scholar***

Abstract

The main purpose of this research is to find out the relationship between capital structure and the firm's financial performance of the listed Pharmaceutical companies in the Pakistan Stock Exchange. A further specific objective is to find out the relation of debt-equity with gross profit, earning per share, and return on capital and return on equity. This research determines that Capital Structure is adversely linked with the profitability, it suggests that a decrease in the profitability of the organizations is due to an increase in debt capital & vice versa, further the results proclaims that capital is not dramatically significant and impacting, hence results in records that debt to equity is nothing to do with ROE, increasing or decrease in debt or equity financing would affect ROE.

Keywords: Return on Capital, Return on Equity, Debt to Equity, KSE-100 Index

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1. Introduction

The pharmaceuticals companies play a pivotal role in every country both from the perspective of the contribution of the health in the gross domestic product and of the contribution to strengthening

* *Institute of Social Sciences, Gaziosmanpaşa University, Tokat, Turkey.*

** *Professor, Department of Business Administration, Gaziosmanpaşa University, Tokat, Turkey.*

*** *Department of Business Administration, Iqra University, Karachi, Pakistan.*

country health index (healthy life expectancy). Pakistan has around 780 small and large pharmaceutical manufacturing units (including around 25 multinationals units) which meet more than 60% of aggregate demand of pharma products, and this industry is classified in two major segments domestic companies and multinationals.

In Pakistan, the Pharmaceutical industry records significant growth in the recent decade compared to the early 2000s. The rationale behind such magnificent development in the industry is accounted for substantial huge investment in Research & Development in each of unit.

The credit not only goes for the huge investment in R&D but also regulatory bodies within Pakistan as well as international guidelines & standards, which probably directs entities to work as Good Manufacturing Practices (GMP) not only on the national forum as well as international. In the present when the world is enjoying the taste of advanced technology one side but on the opposite, it has several technological threats to entire mankind and animals, but not to worry. where scientists work for technological advancement on one side and the next side, they do experiments to meet health-related threats. Meanwhile, in Pakistan, the industry is ready to respond to any of these threats on its best, industry has significant development to produce good hygienic several health-related products from a modest tablet to a refined Biotech, Oncology, and Value-Added Universal mixtures.

The industry has maintained reasonable growth in recent years, despite a general downturn in economic activity and an increase in civil strife. A recent official survey has estimated that average annual growth is 14% and noted that the industry is entirely in the private sector and that 70% of total sales come from local production, with the remainder being imported.

As per the last statistic in 2018 the annual export of pharma products is around $197.62 million which is significantly very high and this was predicted to rise around approx. 6.15% at the end of 2020. Further recent statistics also proclaims the significant contribution of pharma products in the GDP of Pakistan which is more than 1%.

There are 30 Foreign Firms in Pakistan, which contribute around two-thirds of total local production and employ about 25,000 people. There are twelve firms from the USA, nine from the UK, five companies from Germany, three are Swiss companies, and others are from Japan, Holland, and France. These companies are said to have ensured that Pakistani-produced pharmaceuticals have a high product

quality with operational efficiency, underscoring the valuable role of such firms operating in Pakistan.

2. Problem statement

The importance of capital structure has been certified by different members of academies, like Durand (1952), Modigliani & Miller (1958), Weston (1963), and Solomon (1963) by supporting financing decision importance on the profitability of any organization. The organization needs to identify the right combination to get the maximum return to its stakeholders amongst the different capital combinations.

An optimum capital structure refers to giving a maximum return to the shareholders. The Finest Capital Structure means good progress and development of the company, so it needs appropriate awareness and good care to get the finest capital structure (Weston, 1973).

There are various researches which strongly witness substantial correlation amid Entities' Profitability and their Capital Structure here again to testify this rolling theory few of basic research question have been developed as below.

1. Whether or not Net Profit Margin is significantly impacted by Debt to Equity Ratio?
2. Whether or not an Entity's Profitability is significantly impacted by Debt to Equity Ratio?
3. Whether or not Earnings per Share (EPS) is significantly impacted by Debt to Equity Ratio?
4. Whether or not Return on Equity (ROE) is significantly impacted by Debt to Equity Ratio?

The main purpose of the research is to find out the role of capital structure concerning firms' profitability specifically in the Pharmaceutical sector of Pakistan which is listed in the Pakistan equity market. Moreover, the research will similarly employ the conclusions that would reveal the significant robust association among debt to equity proportion and the rest of the variables as aforementioned in research queries. Hence, the core objectives of the study.

1. To find how Net Profit Margin is significantly impacted by Debt to Equity Ratio?
2. To find how Entity’s Profitability is significantly impacted by Debt to Equity Ratio?

3. To find how Earnings per Share (EPS) is significantly impacted by Debt to Equity Ratio?
4. To find how Return on Equity is significantly impacted by Debt to Equity Ratio?

3. Literature review

The magnificent piece of work was done on the capital structure by Modigliani and Miller (1958). This subject received extensive attention in finance and academic researchers started a debate on Capital Structure. The number of studies has been done to show how the capital construction is related or dissimilar to profitability and the firm's financial performance accordingly unlike changes in circumstances. Few researchers identified that no capital structure is perfect for the individual firm and some researchers come to the conclusion that the percentage of liabilities borrowed which is unrelated to the firm. The purpose of all researchers is to identify the best capital structure to boost the earnings of the organization.

Avino and Lazar (2020) introduced quite a considerable set of alternative strategies which drastically can drive healthy benefits from available information of time vary pricing disclosure debt and Equity market including their mix or co-integration. Further the author not only given theory but practically implemented developed models on the US & European capital market by taking a sample of various obligors. Findings reveal outperformed arbitrage practices of trading meanwhile in the financial crisis. Moreover, these new strategies stagnate at a steady correlation along with capital market return rather than standard capital structure arbitrage.

Chivandire et al. (2019) researched to find out how the mobile industry can be effect by debt of equity financing (Capital Structure), they assessed to understand the role or capital structure mixed influenced on entities' financial performance and further elaborated short term financing is preferred by the mobile operator rather long term financing. The study strongly suggests to the industry that searches on the other robust ways which significantly impact the firm's profitability and the regulatory bodies are supposed to take a good measure which can enhance this sector's profitability in context to provide a healthy operating environment by good code of governance.

Das and Kim (2017) shadow banking framework contains Special Purpose Vehicles (SPVs) that need high external financing,

illiquid long-development resources subsidized transcendently by short-development debt and dug liabilities, are known as the capital structure of the SPV. Qualities bring to an antagonistic riddle among senior-note holders, who tackle for an ideal rollover strategy dependent on the other senior tranches with changing rollover dates. This rollover strategy is, thus, considered by capital-note holders (i.e., financial specialists in the value tranche) while picking the capital structure (i.e., the debt-to-asset proportion) of the SPV. Rollover hazard increments in the quantity of time tranches, bringing about a lower harmony level of debt and greater expense of debt. The normal existence of the SPV may likewise be abbreviated. We propose an agreement-based capital structure that moderates these issues and is Pareto-improving for value and debt holders in the SPV.

Sharma and Gupta (2017) researched on the revenue generation techniques by enhancement of operating and net operating income which is based on set targets by venture capitalists for the post-funding of entrepreneurs on their specific ventures. In the very first segment, research modelled to finance capital expenditures by total funds raised from debt or equity, then segregate the model in another block to illustrate the comparison between trading entities and within in the same industry while each parameter kept same likewise same size, same earnings and almost same capital structure, the crux of the entire research is to come with the findings which can elaborate the part of capital formation on the performance of the organization.

McDonald (2016) came up with the glorious research where they have studied persistently increase in bond’s demand by investors to financing their capital structure and financer response related to this brutal demand. Financing companies are very confident of issuance fund/loans to obligors when there is a rise in bond's demand and fund use significantly increases or decreases when the demand of bond found on boom rather stagnate. Debt always remains cheap financing cost of capital firms rely on debt financing when there is less spread amid the corporate yield and treasury rates. Managers make persistent efforts to adjust debt issuance base on the relative cost of debt, findings revealed that debt financing is demanded by the investors especially in the examination of capital structure.

The firm with more debt financing is earning less profit compare to the firm which uses equity financing. Interest payment on debt financing reduces the profit (Eriotis et al., 2002). The study has also shown the inverse association amongst debt ratio and profitability

where an increase in debts the profit of the firm will decrease or vice versa. Studies of Shah and Khan (2007), Rafique (2011), Masnoon and Saeed (2012) show relatively similar findings that here is an inverse connection amid profitability and debts which means if debt financing will increase profit will decrease or vice versa. A study of Nimalathasan and Brabete (2010) was conducted on manufacturing companies in Sri Lanka and illustrates that the debt to equity ratio is positively related to profitability.

Sri Lanka Business companies of CSE show the negative connection among the debt to equity and firm monetary performance (Pratheepkanth, 2011). Another research which has conducted on the Petroleum Industry of Pakistan describes that there is a positive effect of debt and equity on profitability (Ali et al., 2012). Research on Mumbai Stock Exchange Manufacturing Company shows that there is an affiliation between debt/equity and profitability, more use of debt means more loss in the firm profitability (Singh, 2013). Research which was conducted on Registered Sugar companies of KSE shows the perfect effect of long-term debt on firm profitability. Further Researcher advised that firms are supposed to use long term liability as part of firm capital in response to increasing the firm responsibility (Saeed and Badar, 2013).

Rehan et al. (2019) studied how capital structure impacts on the firm performance in the cement industry of Pakistan, and their result proved the significant impact of capital structure on firms' profitability.

The connection amid ownership structure, capital structure, and the firm performance between different trades of a business applying the example of the French manufacturing organizations establish that there is no adverse association of profitability and leverage (Margaritis and Psillaki, 2010). The debt to asset ratio and the interest coverage ratio is related meaningfully with the profit of the organization. Moreover, it is also witnessed that debt and equity ratios are adversely connected with profitability (Chisti et al., 2013).

Few results show a positive association between the capital structure and profitability and few others show that there is an adverse association between variables (Chakraborty, 2010). Organization capital structure is the arrangement of its financial available resources to run the business and the main element to show how the business runs its operations. Important resources for all the organizations, suppliers of finance will apply the control over the organization, but

leverage is a dangerous resource for the organization. Debt and equity are the two main classes for financing.

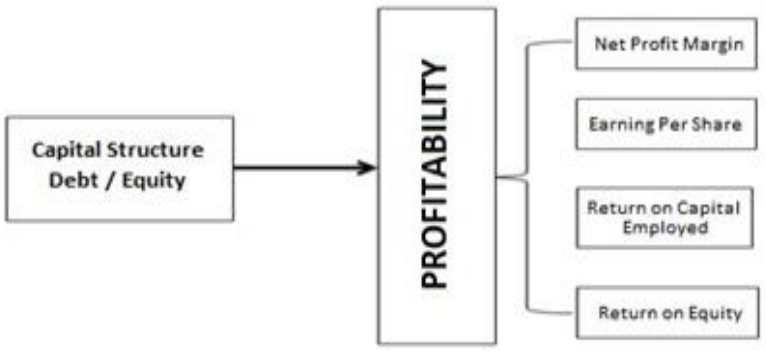
Tailab (2014) studies the factors which affect the profit of United States companies with the outcome of leverage account increase and age a declining impact on return on assets (ROA). On the other hand, the size of liquidity in sales has a favourable effect on the profit of United States companies. But the irrelevant relation is found amongst the size of assets and ROA. The study that the capital structure effect on the profitability of United States Companies related to energy that the full debt has an important impact on ROE and ROA.

Gill et al. (2011) attempt to cover the results of Abor (2005) around the correlation amid capital structure and profitability. The sample has been taken from the service and manufacturing organizations listed companies in New York Stock Exchange (NYSE). The result of the experiment shows a positive relation in short-range debt to total assets and profitability.

3. Conceptual framework

Figure 1

Conceptualization model



Source: Singh and Singh (2016); Rehan, et al. (2019); Sadiq and Sher (2016)

Research Hypothesis:

H1 Debt/Equity has a significant impact on the Net Profit Margin
H2 Debt/Equity has a significant impact on Earnings per Share
H3 Debt/Equity has a significant impact on Return on Capital Employed
H4 Debt/Equity has a significant impact on Return on Equity

5. Methodology

Entire research is based on the phenomenal concept from generated theory, which ultimately brings the research into a positivism research approach where we retest the hypothesis.

This study is solely grounded on a quantitative data set, from various archival sources. Deductive Research Approach is used to test the previously generated theory.

The data was collected from the most authentic, reliable, and useful archival database in Pakistan, by nature data is secondary and quantitative and the rest of the statistics was composed of The Pakistan Stock Exchange.

In Pakistan Stock Exchange, there are 11 listed companies in the pharmaceuticals sector, and we have taken 7 companies. We have ignored the entities which were having a persistent loss in the recent few years because that may ruin our findings and also we could not get the data of companies where we can't find the required numbers as per our described variables.

Data were collected from 2007 to 2018 (12 years) on an annual basis entire data was collected from the Pakistan Stock Exchange and respective annual reports of sampled companies; used data in this research is archival secondary data.

There are several assumptions without them simple regression cannot be used, one of the data should be stationary, to make data stationery we have used Unit Root Test. In the unit root test, there are several levels which witness data stationery such as level unit root, first difference unit root, and second difference unit root, our most of the variable are unit root on the level and first difference.

To understand population structure we used descriptive statistics where the value of mean and standard deviation illustrated robust population structure, as mentioned above pre-requisite for pooled regression or simple regression there are assumptions, another one there should not be multicollinearity amongst independent variable themselves, hence to determine this, we have employed test of Pearson correlation in the second segment of the research and the third segment, we have developed a simple pooled regression model to come up with findings, moreover, EVIEWS 9 was employed for equation modelling in this research.

4. Findings and discussions

Initially, in the first segment which is solely based on population structure, we used descriptive statistics with mean & standard deviation for every single variable. Group of dependent variable comprised of Earnings Per Share, Net Profit Margins, Return On Equity, and Return On Capital Employed and independent variable is Debt to Equity Ratio, as mentioned above Pooled Regression Analysis are used to reach meaningful finding in this research.

Table 1

Levin, Lin & Chu test

Variables	Statistics	Probability	Level
DE	37.9068	0.0005	Zero Level
EPS	-6.89834	0.0000	Zero Level
NPM	-1.65819	0.0486	Zero Level
ROCE	-3.20274	0.0007	Zero Level
ROE	-5.12774	0.0000	Zero Level

To testify the data for unit root, there are developed hypotheses, where are Null Hypothesis: Unit Root is found in Panel Data Set and Alternative: Here is no Unit Root in Panel Data Set. Therefore aforementioned test claims unit-roots of the data set, the table above clearly illustrate that there is no unit root in the panel data set, most of the variables are stationary whether on level or first difference but not on second difference, as the probability is less 0.05 or 5% which claims that do not reject alternative hypotheses. We have completed the first assumption of the Pooled Regression Equation method and can precede equation modeling.

Table 2

Hausman Test

Variables	Fixed	Random	Probability	Appropriate Model
EPS-DE	-8.80245	-7.23085	0.1083	Random Effect
NPM-DE	-0.0436	-0.04601	0.3362	Random Effect
ROCE-DE	-0.08406	-0.08315	0.9167	Random Effect
ROE-DE	-0.02707	-0.03175	0.5825	Random Effect

After running pooled regression, there are further processes that drag the research on appropriateness, whether the research model fits the fixed effect of random effect, coming to these crucial decisions we are to use the Hausman test, which is the significant measure to choose the model. Null Hypothesis witnessed model appropriateness with Random Effect and Alternative reports model appropriateness with Fixed effect, hence in the above-mentioned table, all of the p-values are greater than 0.05% or 5% which means that all of the four models are best fitted with Random Effect Data Appropriateness.

Model 1

Table 3

Dependent Variable: EPS				
Method: Panel EGLS (Cross-section random effects)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	22.7531	5.1852	4.3881	0
DE	-7.2309	3.2512	-2.2241	0.0289
Weighted Statistics				
R-squared	0.0559	**Mean dependent var**		6.4496
Adjusted R-squared	0.0444	**S.D. dependent var**		16.1355
S.E. of regression	15.7735	**Sum squared resid**		20401.8
F-statistic	4.8531	**Durbin-Watson stat**		1.0145
Prob(F-statistic)	0.0304			

The regression model 1 demonstrates that EPS (Earning per Share) has a huge impact or impact on DE (Debt to Equity). The Probability value is .00289 which is under .05 or 5% that implies dependent variable (EPS) Earning Per Share impacts or effects on debt to equity or D.E or can impact on E.P.S (Earning Per Share) just 4.85% and other portion of percentage effects on hidden factors which is also part of this model that means external factors are influencing on 95.15%. The Prob. (F-statistic) is additionally noteworthy that is 0.0304 which is under 5% or .05 and the Derbin Watson-detail demonstrates 1.01. This model states that earning per share has a critical impact on debt to the equity that implies Capital structure impact on Profitability in the pharmaceutical sector which is recorded in Pakistan Stock Exchange.

Model 2

Table 4

Dependent Variable: NPM				
Method: Panel EGLS (Cross-section random effects)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.141	0.016	8.7931	0
DE	-0.046	0.0095	-4.8477	0
Weighted Statistics				
R-squared	0.2357	**Mean dependent var**		0.03697
Adjusted R-squared	0.2256	**S.D. dependent var**		0.05024
S.E. of regression	0.0443	**Sum squared resid**		0.14905
F-statistic	23.4367	**Durbin-Watson stat**		1.09079
Prob(F-statistic)	0			

Table 4 illustrates the substantial adverse correlation amid Debt to Equity ratio and NPM (Net Profit Margin), this also witnesses a single unit positive change in Debt to Equity will deduce 0.046 unit change in net profit margins. Generally speaking as much a firm gauge debt financing as much debt to equity ratio rises and similarly, they have to pay off financial obligation which will be reflecting in profit and loss account by decreasing net profit that clearly means as much a firm increases debt financing as much net profit will be decreasing.

Model 3

Table 5

Dependent Variable: ROCE				
Method: Panel EGLS (Cross-section random effects)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.3135	0.0267	11.7592	0
DE	-0.0831	0.0207	-4.0087	0.0001
Weighted Statistics				
R-squared	0.1785	**Mean dependent var**		0.13472
Adjusted R-squared	0.1676	**S.D. dependent var**		0.10846
S.E. of regression	0.0985	**Sum squared resid**		0.72802
F-statistic	16.3014	**Durbin-Watson stat**		1.66960
Prob(F-statistic)	0.0001			

The regression model 3 demonstrates that ROCE (Return on Capital Employed) is a noteworthy impact or impact on DE (Debt to Equity). The Probability value is .0001 which is under .05 or 5% that implies dependent variable ROCE impact or effects on debt to equity or DE or can impact on ROCE (Return on Capital Employed) just 16.30% and other portion of percentage effects on hidden factors which is also part of this model that means external factors are influencing on 83.70%. The Prob. (F-statistics) is .00012 which is under 5% or .05 and the Durbin Watson-detail demonstrates 1.66. This model tells that ROCE has a critical impact on debt-to-equity that implies Capital structure has a critical influence on Productivity in the pharmaceutical segment which is listed in the Pakistan Stock Exchange.

Model 4

Table 6

Dependent Variable: ROE				
Method: Panel EGLS (Cross-section random effects)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.2342	0.0209	11.2074	0
DE	-0.0318	0.0175	-1.8166	0.0733
Weighted Statistics				
R-squared	0.0424	**Mean dependent var**		0.13670
Adjusted R-squared	0.0296	**S.D. dependent var**		0.08817
S.E. of regression	0.0869	**Sum squared resid**		0.56582
F-statistic	3.3183	**Durbin-Watson stat**		1.83647
Prob(F-statistic)	0.0725			

The regression model 4 demonstrates that ROE has an insignificant impact upon DE (Debt-to-Equity). The Probability value is .0733 which is more than .05 or 5% which implies the dependent variable (ROE) Return on Equity has no impact or effects on debt-to-equity or D.E further result shows that the R-square is only 4% and the f-statistics value is 3.33%. The Prob. (F-statistic) is additionally noteworthy that is .07 which is more than 5% or .05 and the Durbin Watson-detail demonstrates 1.83. This model states that ROE has no substantial effect on debt to the equity that implies Capital structure does not impact Profitability in the pharmaceutical sector which is recorded in Pakistan Stock Exchange.

Table 7

Correlation

Correlation Analysis					
Correlation	**DE**	**EPS**	**NPM**	**ROCE**	**ROE**
DE	1				
EPS	-0.026015	1			
NPM	-0.556552	0.131238	1		
ROCE	-0.433966	0.453419	0.465727	1	
ROE	-0.234697	0.430605	0.614642	0.781156	1

Above mentioned correlation model shows an adverse relationship amid Debts-to-Equity, i.e. independent variable and Profitability (EPS, NPM, ROCE, and ROE), i.e. dependent variable.

5. Discussions

The purpose of the study was to evaluate the impact of capital structure on firms' profitability in the Pharmaceutical industry of Pakistan. Therefore, we have taken Net Profit Margin, Earnings per Share, Return on Capital Employed, and Return on Equity, as dependent variables, and debt to equity ratio as the main independent variable. There are four individual models that determine the impact of the capital structure on the firms' profitability.

Hypothesis 1: Debt/Equity significance effect on net profit margin.

The alternative hypothesis HI has accepted and Ho hypothesis is rejected. This answer to research question 1: What are the correlation between debt-to-equity and net profit margin? The results revealed that the debt-to-equity and net profit margin has a negative relationship with each other means the debt/equity ratio will be increased net profit margin will be decreased or vice versa. This result is matching with earlier research of Singh and Singh (2016), Eriotis et al. (2002).

Hypothesis 2: Debt/Equity significance effect on earnings per share.

The alternative hypothesis HI has accepted and Ho hypothesis is rejected. The results revealed that the debt-to-equity and EPS has a negative relationship with one another means debt/equity ratio will be

increased EPS will be decreased or vice versa. The study is matching with the previous research result of Salim and Yadav (2012).

Hypothesis 3: Debt/Equity significance effect on return on capital employed.

The alternative hypothesis HI has acknowledged and Ho hypothesis is rejected. The results revealed that the debt-to-equity and ROCE has a negative relationship with each other means debt/equity ratio will be increased ROCE will be decreased or vice versa. This result is matching with earlier research of Murtala et al. (2018).

Hypothesis 4: Debt/Equity significance effect on return on equity.

The alternative hypothesis HI has rejected and Ho hypothesis is accepted. The results revealed that debt-to-equity and ROE have a negative but insignificant correlation with each other at 5% but at 10% they have a substantial negative correlation that means the debt/equity ratio will be increased ROE will decrease or vice versa. The study is matching with the previous research result of Saeedi and Mahmoodi (2011).

This study includes only secondary data and restricts on one specific industry. Furthermore, the period considered is only 12 years. To keep the previous points in mind the research can do further research in this area by adding more industry, which also can increase the period of time and may include primary data which makes results more reliable. Research can add some more variables i.e. intervening moderating and also some more independent and dependent variables like; debt to assets and the weighted average cost of capital (WACC) as independent and gross processing margin (GPM), ROA, Tobin's q as the dependent variable.

Capital structure is not all about debt to equity of an organization; it is also concerned about the managerial operations of the organization. The stability of the process should exist between debt and equity, as it plays an important role in the profitability of any organization.

6. Conclusions

The purpose of this research is to explore the association of capital structure and profitability of the pharmaceutical firms which are listed in the Pakistan Equity Market showing profit in our desired period

of study i.e. 2007-2018 which are based on eighty-four observations and analysed with the help of pooled regression model. The research concludes that a combination of debt-to-equity has a substantial effect on profitability and negatively associated with the profitability of the firm which means that a decrease in profitability of the firm is caused by an increase in debt-to-equity ratio.

Most of the findings in the research reconfirms previous research but in different countries and different time horizons, interestingly few of the logical observation had been driven in this research to give an edge to understand the mix of capital structure in emerging pharmaceutical industry in Pakistan, hence prudent asset financing in this industry gauge healthy competitive edge to the entities within the pharmaceutical sector in Pakistan.

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