

ASSETS AND LIABILITIES MANAGEMENT DURING THE CRISIS - A STUDY ON BANKS IN ROMANIA

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Abstract: *Financial crisis with its main component, the banking crisis, had a negative influence on the US and European banks, affecting mostly bank assets with its toxic assets subprime mortgages. The financial crisis has affected all the economies, has had and still has a negative impact on the entire banking system. The main component of the financial crisis was and remains the banking crisis, which continued with the sovereign debt crisis and then returned under a new form of the Cyprus banking crisis. In this paper, we analyzed the changes in the evolution of assets and liabilities of a sample of banks in Romania with a system of financial ratios. For this reason, we used the ratios method in the vertical and horizontal analysis for the period 2006-2015 in order to evaluate the bankers' decisions. In this research, we analyzed whether performance indicators such as ROA and ROE establish a causal connection with indebtedness indicators, liquidity ratios and solvency ratios. The results showed that in the case of the analyzed banks, there is a dependency relationship between the solvency ratios and the "Total Risk Ratio", "Return on Assets" and "Long Term Funds to Long Term Assets". We highlighted that ROE has an insignificant influence on bank solvency, while other asset and liability indicators do not influence the solvency of the banks studied. Finally, we established that the financial crisis started in 2007 continues today and it is likely that it will begin to manifest itself with this year after the BREXIT.*

Keywords: *assets; liabilities; deposits; banking; analysis.*

JEL classification: *C61; G11.*

1. Introduction

The assets and liabilities of the bank's balance sheet show the financial position of the bank, with a view to measure the liquidity and interest rate risk. As a measure of liquidity management, banks are required to monitor their liquidity by establishing internal prudential limits with the approval of the board committee. The major objectives of our investigation in the banking sector are to provide financial data about liquidity, solvency, performance and risks based on balance sheet and income statement information during the period 2006-2015. That is why we analyze the evolution of a sample of credit institutions in Romania based on ALM (Asset – Liabilities Management) techniques which include financial ratios of assets, liabilities, equity and the capital adequacy according with Basel Agreements.

2. Literature Review

The recent global financial crisis has negatively affected the performance of most banking sectors around the world. Mirzaei (2013:27-44) analyses “the impact of bank market structure and efficiency on the profitability and stability of 6540 banks in 49 emerging and advanced countries during the crisis period 2007-2010” and find that “market concentration has a negative impact on bank profitability and stability while controlling other factors but in the same time the efficiency improves both the profitability and stability of individual banks during the crisis”. Many analysts (Allen&Gale, 2007; Claessens&Kose, 2013; Kenourgios&Padhi, 2012: 24-38) believe that the financial crisis was a new phenomenon, unprecedented in the world economy. The “Pearl Harbor’s economy”, “the explosion of the financial bubble”, “the new spill”, the “vortex” are some of the phrases used by specialists like Warren Buffett or Alan Greenspan to define the global financial crisis. This unprecedented event has left its mark on all countries worldwide. Given the fact that it had a negative impact, the situation requires an analysis of the factors which led to it. Therefore, the aim of their paper is to draw a clearer picture of the phenomenon and to identify possible solutions (Bătrâncea, et al, 2009:143 – 155). The banking crisis is a subcategory of the financial crisis, consisting in moments of panic, temporary confusion regarding incidents within the financial system. The crisis began in the U.S., but because of the deregulation and financial liberalization, this phenomenon has spread to Europe and other continents, having a negative impact on the economy and forcing banks to deal with a difficult situation. After receiving bailouts from governments, some banks were nationalized, others were saved, but in many cases they went bankrupt (Bătrâncea et al, 2013:16-29). An important cause of the current financial crisis can be identified as the absence of regulation in the banking (financial) system of the United States (according with Basle I Capital Accord in 1988 and Basle II – the New Capital Framework in 1999), but also in the decrease of the FED reference interest after the terrorist attack from 2001 (Bătrâncea et al, 2009:58-64).

Asset Liability Management (ALM), aimed to reduce risks for banks and maximize total revenue, is a core part of banking. In their paper, Faruk and Alm (2014:106-128) evaluated previous performance through ratio analysis and showed graphically the trends of the financial position of banks. In the literature, there are other approaches to the causes underlying the problems banks face, especially during crises, and some of them consider that the risks depend on variations in the level of income set and expenditures covered from them. The main sources of income are interests and investments made, and the main expense is represented by the interest on deposits.

Bankruptcy prediction models are generally known as able to identify the factors menacing financial entities. Financial theory acknowledges three types of method investigating financial difficulties like the univariate analysis, multivariate analysis and logit analysis (Bătrâncea et al, 2013: 18-30).

For solving practical asset-liability management problems, Ferstl and Weissensteiner (2011:182-192) use a first-order unrestricted vector autoregressive process in order to model asset returns and state variables and include, besides equity returns and dividend-price ratios, Nelson/Siegel parameters to estimate the trend of the yield curve. Their purpose was to minimize the Conditional Value at Risk of shareholder value, i.e., the difference between the mark-to-market value of (financial) assets and the present value of future liabilities.

Lileikiene (2008:32-39) reports methods and strategies of asset and liability management in commercial banks, in addition he also includes comparative analysis. The author noticed that was very important for commercial banks to choose such performance strategy that would reduce the credit-, liquidity-, interest-rate-related risk and would balance the risk, profitability, liquidity and security. The success of any organization depends on how efficiently it uses assets and maintains a sound solvency position. Singh (2014:858-862) mentions that this is possible only with help of effective Asset and Liability Management (ALM), which is one of the important tools of risk management in commercial banks of India. Other study aims to analyze whether banks' deviation from the mainstream tendencies in terms of asset and liability allocation enables them to perform better than their competition. The analysis brings out the significance of liability allocation and of the effect of deposit strategies as a primary source of funding (Cenktaş and Begumhan, 2011). An efficient asset-liability management requires maximizing banks' profit as well as controlling and lowering various risks. That is why a study brings new evidence on the performance of emerging market banks with different managerial philosophies by comparing asset-liability management in crisis (Tektaş, et al, 2005:135-149). The objective of another paper is to assess the investment policies in the banks with a view to suggesting better policy for better management of assets and liabilities while aiming distress resolution (Adegbe, et al, 2013). In the same time, liquidity is necessary for banks to compensate the expected and unexpected balance sheet fluctuations and to provide the funds necessary for development. Liquidity represents the capacity of a bank to cope efficiently with the withdrawal of deposits and the maturity of other debts and to cover the necessary of additional financing for the credits and investments portfolio (Bătrâncea, et al., 2008: 111-123).

3. Method and Results

Research methodology is based on analyzing assets-liabilities ratios, the evolution of these ratios and the balance and off-balance bank growth. Also, we also used the comparison method among assets-liabilities ratios during the selected period. The research that we have undertaken was based on published financial statements of the analyzed banks. The evolution of the banking assets rates are presented in the chart below. We computed each indicator as a ratio between every asset position and the total assets from the aggregate balance sheet of the sample of analyzed banks.

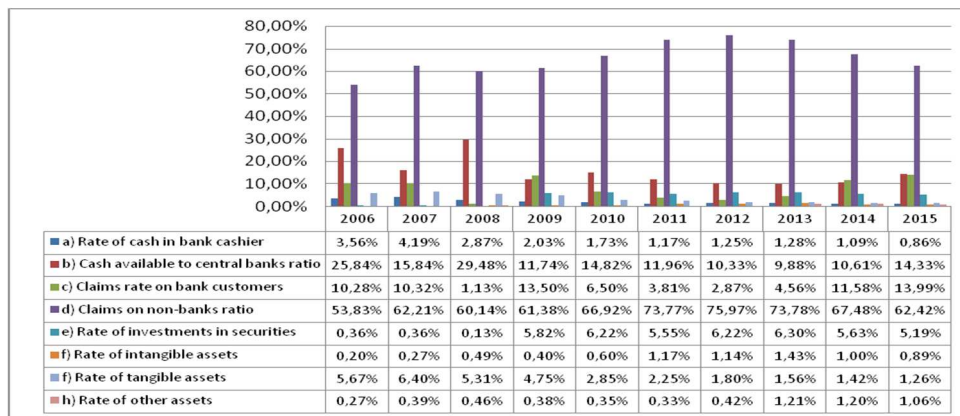


Chart 1: The evolution of the assets ratios of the analyzed banks
Source: Own calculus based on the financial statements

The data in the above chart shows that in total assets the claims on non-bank have the greater percentage, which is a normal aspect in the banking activity. As can be seen, the non-banking claims rate is more than 50% of the total assets. On the second place, we find the funds available at central banks with a share of over 10%. These weights are complemented by important banking claims on customers who have followed an upward trend in the recent analyzed years. We conclude that the management of the bank assets is primarily aimed at the type and the amount of deposits that a bank holds, and then the volume of other loans depends largely on its customers. Therefore, decisions made by the bank's management do not refer to deposits, but to the investment in the assets. Banks supervise the allocation of the deposits that receives and determines the recipients of loans. The key element of this strategy of the asset management is a careful management of credit. They are granted mostly short and finance working capital requirements by the customers, in order to cover existing deposits. Strategy Asset Management is based on the idea that the bank can cover the necessary liquidity by converting assets into cash, but the credit as the main asset, is not always easily transformed into cash, especially not at times of economic recession.

Passive operations - Basic ways of attracting bank resources

The activity of a bank always begins with the deposit taken from clients. Different types of debt existing on the balance sheet of a bank are almost universal. Their composition varies widely depending on the business of a particular bank, on the market orientation and price characteristics and on the types of supply of loans at a specific period. The financial structure of a bank has a direct impact on the cost of operation. Therefore, this determines the potential profit of the bank and its risk level. Debt structure reflects also the specific policies of asset management, debt and risk. The basic equation of passive operation of a bank is the following:

$$\text{Total Liabilities \& Shareholders' Equity} = \text{Liabilities} + \text{Shareholders' Equity}$$

Banking operations are based, in principle, on attracted sources, for which banks offer their customers a wide range of savings by: period of deposit; existing competition in the interbank market and structure and household income.

Subordinated debts are included in the additional bank capital, up to 50% of equity.

The structure ratios of the attracted resources - ways of the bank funds analysis

The structure ratios of the funds represent one of the pillars of banking, highlighting the share of the debts of the bank and other assimilated liabilities in total. These indicators are calculated as rates between each debt and total debts.

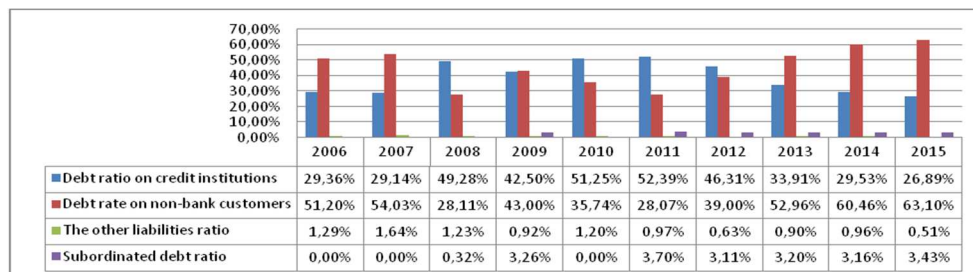


Chart 2: The evolution of liabilities ratios of the analyzed banks

Source: Own calculus based the balance sheet

As can be seen from the above chart, the largest share of the total liabilities is the customer deposits, followed by the liabilities to credit institutions and the subordinated debt. Note that these have fluctuated from year to year, the total debt remained at approximately the same level of 90%, depending on the financing needs.

As shown by the above data, the share of liabilities to customers has the higher debt structure in the analyzed period. This report was reversed during the crisis, with liabilities of banking institutions registering levels 50%. While accounting for only 3%, the subordinated debts are the most important components of the total debts.

The analysis undertaken evidences that, in addition to short-term deposits, the bank must also have new sources of funding to meet the needs of its customers, which may require short or long term loans. It is imperative that banks should pay more attention to attracting additional sources of financing, and monitoring costs of deposits and other cost items. In this regard, banks must focus on attracting funding sources to minimize the cost and to establish a structure of deposits, loans and capital in order to provide the desired level of the stability funds. The bank has the possibility of placing resources available in high-yield assets, which often requires investing funds on a longer period and at a higher risk. Liabilities management strategy is mainly focused on the supremacy of the control funds of bank assets. The main control lever is represented by: the interest rate; other conditions offered by the bank for deposits and loans in order to obtain the desired size and cost.

Banks own resources

The banks' own resources have played an important role since their establishment. Due to this role, it has become the essential capital of bank management in recent years.

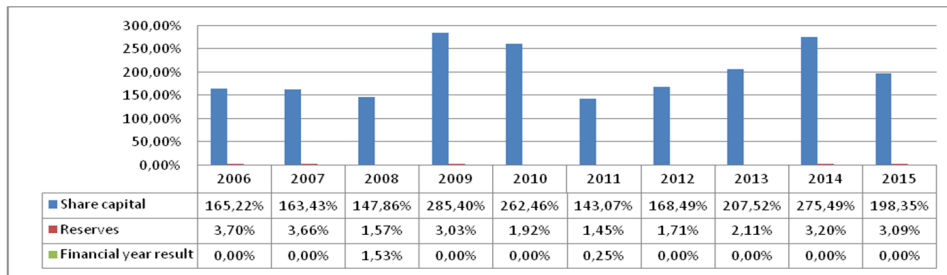


Chart 3: The evolution of equity of the analyzed banks
Source: Own calculus based on the balance sheet

The above data shows that in the entire period and particularly during the crisis, banks were strongly capitalized in order to cover losses. Another aspect related to the evolution of debt and equity can be seen in the chart below.

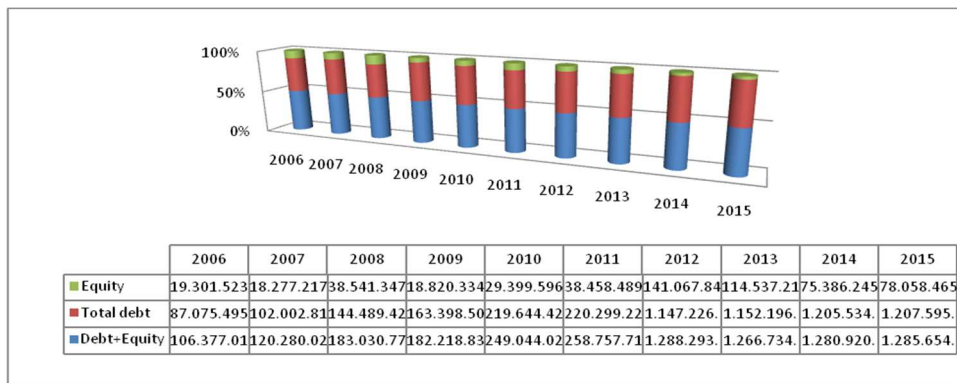


Chart 4: The evolution of liabilities and equity
Source: Own calculus based on the balance sheet

It can be noted that total liabilities are higher, thus representing a higher percentage than equity, aspect which is normal in the business of a financial institution. We consider that a bank with a higher capital indicator will better survive the decline in asset values when depositors and bank creditors are in a dangerous situation. Another aspect of the analysis is the level of the banking solvency, as follows.

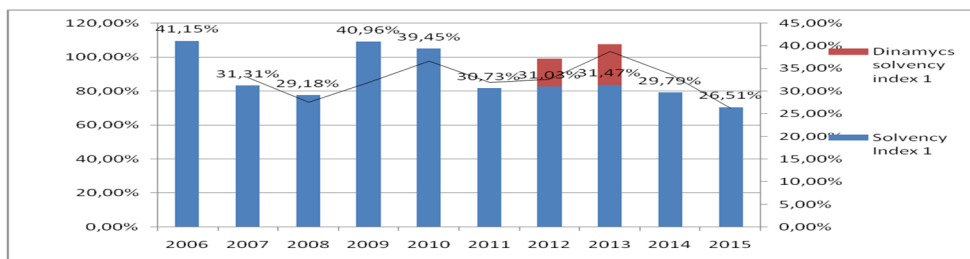


Chart 5: The Evolution of Solvency Index 1
Source: Own calculus based on the balance sheet

We note that the solvency index 1 decreased during the crisis, and it was situated at the same level as in 2015. This means that the analyzed banking system has not emerged from the crisis yet. On the other side, solvency 1 was located at over 19% and at the upper limit of 12% for the entire period, an aspect which highlights the good solvency of these banks.

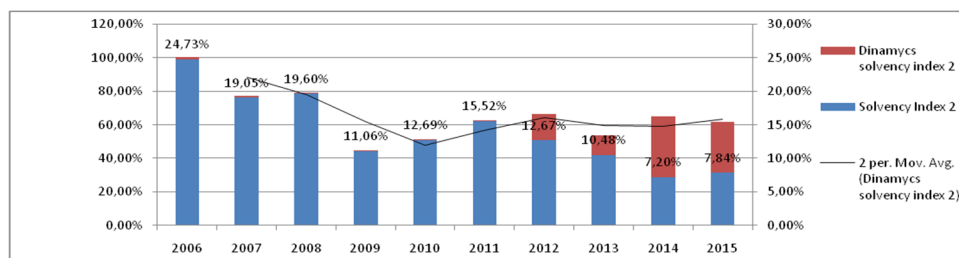


Chart 6: The evolution of solvency index 2
Source: Own calculus based on the balance sheet

Solvency 2 was higher than the minimum of 8% required by Basel II minimum capital requirements compliance. Banks increased the overall growth rates, a growth which is included among the structural changes that occur in a bank.

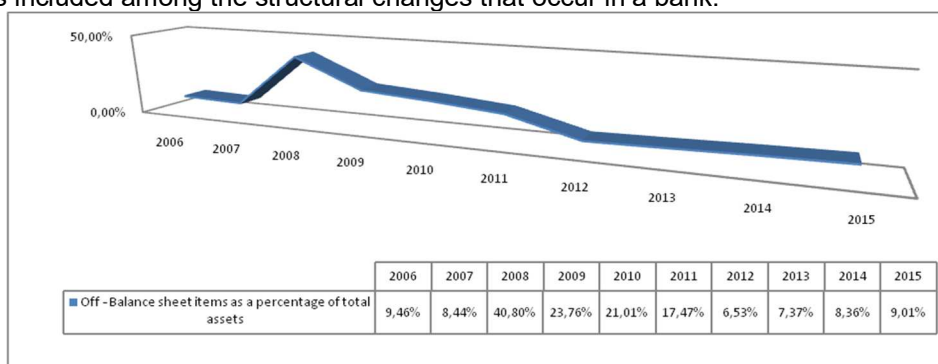


Chart 7: The evolution off - balance sheet items at the analyzed banks
Source: Own calculus

The above data shows a steady increase in the assets and the risk-weighted assets, but also an increase in equity. In addition, the figures underline that the extent of the banks' growth is balanced or that banks were able to maintain the capital requirements in relation with total assets and with risk-weighted asset growth. A graph of this kind can provide a proof of the problems that may arise regarding capital adequacy, which can be generated as a result of rapid expansion. The above data can be used to increase the off-balance and the weighted elements.

In order to identify the causes of banks' solvency, we chose a sample of banks. So we analyzed the model of solvency index 1 and solvency index 2 using RStudio software.

A. The model of IS1

Firstly, we analyzed the relationship between IS1 on the one hand and RGR and IS2 on the other hand. The statistical analysis shows that between the dependent

variable IS1 (solvency index 1) and the independent variables RGR (Overall Risk Ratio) and IS2 (Solvency index 2) there is a strong linear connection as follows.

a) Build the linear model:

First we established the linear model function: lm (formula = $IS1 \sim RGR + IS2$)

The values of coefficients of the regression equation are presented below.

The independent variables	Estimate	Std.Error	t-value	Pr(> t)
Intercept (constant)	34.1568	11.4685	2.978	0.0044 **
RGR	-0.2683	0.1291	-2.079	0.0426 *
IS2	1.2643	0.1556	8.128	8e-11 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12.47 on 52 degrees of freedom; (11 observations deleted due to missingness) Multiple R-squared: 0.5862, Adjusted R-squared: 0.5703, F-statistic: 36.84 on 2 and 52 DF, p-value: 1.085e-10

The next step is to test the model validity of IS1 using ANOVAs function

b) Testing the IS1 model validity (Analysis of Variance)

The independent variables	Df.	Sum Sq	Mean Sq	F value	Pr(>F)
RGR	1	1184.2	1184.2	7.6146	0.007976 **
IS2	1	10274.1	10274.1	66.0621	7.999e-11 ***

Residuals 52 8087.1 155.5; Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Conclusion: Both linear model „lm” and „ANOVAs” functions show us that the model is significant such as:

$$IS1 = 34.1568 - 0.2683 RGR + 1.2643 IS2$$

So, we conclude that for a change of 1 unit of RGR, IS1 changes by -0.2683. On the other hand for a change of 1 unit of IS2, IS1 changes by 1.2643. Also for a change of 1 unit of RGR and IS2, IS1 changes by 0,996 (1,2643 – 0,2683) and finally for RGR =0 and IS2 =0 $IS1 = 34.1568$ (no action from RGR and IS2)

B. The model of IS2

The statistic analysis shows that between the dependent variable IS2 (solvency index 2) and the independent variables ROA (Return on assets), KFP (Long term funds to Long term assets) and IS1 (Solvency index 1) there is a strong linear connection as follows.

a) Build the linear model:

lm (formula = $IS2 \sim ROA + KFP + IS1$)

The values of coefficients of the regression equation are presented bellow.

The independent variables	Estimate	Std.Error	t-value	Pr(> t)
Intercept (constant)	-11.57563	3.91297	-2.958	0.00468 **
ROA	0.66611	0.26848	2.481	0.01644 *
KFP	0.08058	0.02704	2.980	0.00441 **
IS1	0.41386	0.04883	8.476	2.64e-11 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1; Residual standard error: 6.788 on 51 degrees of freedom (11 observations deleted due to missingness); Multiple R-squared: 0.6369, Adjusted R-squared: 0.6156; F-statistic: 29.82 on 3 and 51 DF, p-value: 2.81e-11

b) Testing the IS2 model validity (Analysis of Variance)

The independent variables	Df.	Sum Sq	Mean Sq	F value	Pr(>F)
RGR	1	317.8	317.8	6.8988	0.01136 *
KFP	1	493.7	493.7	10.7166	0.00191 **
IS1	1	3310.1	3310.1	71.8494	2.636e-11 ***

Residuals 51 2349.6 46.1; Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Conclusion: Both „lm” and „ANOVAs” functions show us that the model is significant:

The model of IS2 is:

$$IS2 = -11,57563 + 0.66611 ROA + 0.08058 KFP + 0.41386 IS1$$

This means that for a change of 1 unit of ROA, IS2 changes by 0,66611. Also, for a change of 1 unit of KFP, IS2 changes by 0,08058. On the other hand for a change of 1 unit of IS1, IS2 changes by 0,41386 and for a change of 1 unit of ROA, KFP and IS1, IS2 changes by 1,16055. Finally, for ROA =0, KFP = 0 and IS1 =0, IS2 = -11,57563 (no action from ROA, KFP and IS1).

4. Conclusions and limitations

This article presents the results of an investigation in private banks, related relationships, the potential advantages and challenges of introducing asset liability management to this banking industry. Also ALM is perceived to be a source of substantial improvements within the private banking industry. The main advantage of ALM is perceived to be its ability to manage clients' long-term risks.

The results of this article have a number of implications for the private banking industry. First, based on ALM, private banking has a general overhaul of its risk management strategies and concepts. In this sense, we show the importance of Solvency index 1 and Solvency index 2 and their connections with other indicators such as “Overall Risk Ratio”, “Return on Assets” and “Long term funds to long term assets”.

Second, ALM might offer a solution to structured assets and source of funds. That is why we analyzed the evolution of assets, liabilities and the equity to show if the analyzed banks have enough capacity to use their funds to get profit. Our results

highlight that the management of financial risks for private clients faces some challenges that could be overcome by implementing new risk management devices, such as ALM techniques. The paper recommends among others that the industry, regulators and supervisory agents should institute a good and sound investment policy for effective management of assets and liabilities in the banking industry. We note that a high level of solvency (IS1 and IS2) represents an effective capital adequacy and a competitive position in the market, due to a high capacity for further development of the banking activity.

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