

# ASSESSMENT OF THE COMPETITIVE ENVIRONMENT IN THE BANK MARKET OF UZBEKISTAN THROUGH "BUN" INDICATOR

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Research Article

## Assessment Of The Competitive Environment In The Bank Market Of Uzbekistan Through "Bun" Indicator

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### ANNOTATION

The banking system of Uzbekistan consists of banks with different forms of ownership. The "Bun" indicator used to assess the competitive environment in the banking system. Banks operating in Uzbekistan in 1999-2018 selected for the analysis. According to the analysis, while banks with a state share have more monopoly power, private banks have lower monopoly power. Foreign banks, on the other hand, have the lowest level of monopoly power.

**Keywords:** Banking system, Competition, Monopolistic competition, Income function, Fixed and random effects, structural and non-structural methods.

### INTRODUCTION

The banking system is the basis of the financial system of Uzbekistan. Although the number of commercial banks had been relatively stable since independence, their market share and monopolistic power might have varied. The study of interbank competition was a critical issue to determine the monopolistic power of commercial banks. The study of the competitive environment in banking services in an objective and quantitative form was scientifically and practically relevant.

There were two methods of assessing competition in the banking market in the scientific literature. They were called structural and non-structural and had different theoretical bases. Structural evaluation based on a theoretical framework for market structure. There were 4 main types of market structure: perfect competition, imperfect competition, oligopoly, and monopoly. The measure of competition based on the theory of traditional industrial organization was the direction created on the types of the market structure mentioned above and based on the principle of structure-action-result. This method uses the enterprise market share, the concentration ratios of large enterprises, and the Herfindal-Hirschman index to estimate monopoly power.

The no-structural evaluation direction would be based on the theory of a new industrial organization that did not consider the structure of competition in the market. In this regard, the N-statistical indicator (Panzar & Rosse, 1982, 1987), the Lerner index (Lerner, 1934) and the "Bun" indicator (Boone, 2000, 2001, 2008, 2014) were used to assess the monopoly power. These three

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indicators did not use market structure data to assess the competitive environment and examine an enterprise's monopoly behaviour.

According to Boone (2008), productive enterprises were more encouraged in a highly competitive environment, and he introduced a new competitive indicator based on this idea. The essence of the indicator was that if enterprises were operating inefficiently in a highly competitive environment, they would be punished more severely in terms of profit. According to the efficiency hypothesis, high-efficiency enterprises were more profitable than their low-efficiency competitors and could attract more customers from the market (Demsetz, 1973).

This indicator reflected the change in the market share of an efficient enterprise, which occurred when these customers move from inefficient to efficient enterprises. Such "migration" of customers from an inefficient enterprise to an efficient enterprise might eventually result in the inefficient enterprise leaving the market. Boone (2008) argued that the effect of customer reallocation, that was, the transition from inefficient to efficient, increased in proportion to the level of competition. Increased competition led to a decrease in the output of enterprises. However, this rate of decline was minor, inefficient enterprises. As a result, the market share and profits of productive enterprises increased while inefficient enterprises decreased. Hence, the relative differences in the profits of the enterprises would affect the level of competition.

The disadvantage of this indicator was that it focused on only one factor that affected competition and appeared to simplify significantly economic reality. Efficiency-related gains might not always seek to increase profits or market share. For example, a bank might spend its efficiency gains on new services, innovations, and information technology upgrades to gain a competitive advantage in the future, rather than to increase profits or market share in the current period. In particular, the evaluation of the Bun indicator over the years affected its reliability. Long-term valuation increased its reliability because banks produced almost the same type of product in the long run. However, knowledge of the short-term competitive environment played an essential role in the development of economic measures. Therefore, the analysis was important both in terms of periods.

Another disadvantage of this indicator was that if the bank's strategy was to compete with quality rather than price, then the coefficient  $\beta$  might be positive (Tabak et al., 2012). In this case, it was impossible to determine the situation. This shortcoming of the indicator was a shortcoming inherent in all non-structural evaluation methods of competition. After all, they were all based on the assumption that banks offer the same type of "goods and services". In addition, this indicator was relatively new compared to other methods of evaluating competition, the shortcomings of which had not yet been fully explored.

Assessment of interbank competition based on this indicator had been used in many scientific studies in recent years. And some of them included creating a clear picture of the research. In a study by Van Leuvensteijnet al. (2011), Competition in the credit markets of the 5 most major countries in Europe, the United States, the United Kingdom, and Japan, were compared based on the "Bun" indicator. According to the results, the U.S. credit market was the most competitive, while in Europe, the German and Spanish credit markets were the most competitive. Also, competition in the Italian credit market had declined over time, while it had intensified over time in Japan.

In a scientific study of Turkish banks, the "Bun" indicator was close to zero and had a minor variance, while the Lerner index showed a slight increase in banks' market power (S. Kasman & Kasman, 2015). Also, if the bank's monopoly power over the price increased, the bank's stability might increase. In addition, to increase the stability of the Turkish banking system, it was

## ASSESSMENT OF THE COMPETITIVE ENVIRONMENT IN THE BANK MARKET OF UZBEKISTAN THROUGH "BUN" INDICATOR

necessary to increase the monopoly power of banks; the authors said this was because intense competition forced banks to finance high-risk projects to make a profit. As a result, there was a problem with the stability of the banking system.

Delis (2012), in his study, analyzed the monopoly power of banks in the banking systems of 84 countries. According to the results, the policy of financial liberalization would increase interbank competition in developed countries. However, in developing countries, financial liberalization was not as rapid as in developed countries due to weak institutions and low economic growth. According to him, in order for economic policies to increase interbank competition and efficiency to be successful, the country's level of development must be high.

According to Love & Martínez pería (2015), solid interbank competition made it easier for businesses to obtain cheap credit. They analyzed the interdependence of interbank competition access to credit in 53 countries. According to the results, an increase in the Lerner index or Bun indicator would reduce the ability of enterprises to obtain credit.

To study the relationship between interbank competition and banking stability, A. Kasman & Carvalho (2014) analyzed 272 banking indicators in 15 countries in Latin America. According to them, intense competition increased the efficiency of banks and had a positive impact on their stability. However, an increase in the size of a bank-led to an increase in its inefficiency and instability.

### MATERIALS AND METHODS

This indicator assessed the intensity of competition using the following profit model (Booneet et al., 2011):

$$\ln(\pi_{it}) = \alpha + \beta \ln(mc_{it}) + \varepsilon_{it} \quad [1]$$

In this case,  $\pi_{it}$  was the profit of a particular bank in period t, and  $mc_{it}$  was the marginal cost of bank i in period t. The coefficient  $\beta$  indicated the profit elasticity, i.e. how much the increase in the bank's expenses per unit would reduce its profit. Theoretically, this coefficient sign was negative, which meant that an increase in marginal cost reduced profit.

In recent scientific studies, two changes had been made to the above Model [1]. The marginal cost was directly estimated (Van Leuvensteijn et al., 2011). In the second modification, efficient banks might increase market share by lowering costs and increasing market share by lowering the price. It was necessary to take the bank's market share, not profit, as a dependent variable (Tabaket al., 2012; Van Leuvensteijn et al., 2011; Van Leuvensteijn et al., 2013):

$$\ln(ms_{it}) = \alpha + \beta \ln(mc_{it}) + \varepsilon_{it} \quad [2]$$

In this case,  $ms_{it}$  - meant the i bank's market share in period t. In this case, the market share was calculated based on the share of a particular bank's assets in banks' total assets. The expected indication of a marginal cost ratio was negative, and an increase in marginal cost should reduce the bank's market share in a highly competitive environment. This was because the increase in banking costs should also increase the cost of banking services. Rising prices for banking services led to the "migration" of bank customers to other banks in a highly competitive environment.

The share of loans in the structure of Uzbek assets was high, and it was essential to analyze the competition in the credit market. Therefore, the competition in the credit market was analyzed based on the following Model:

$$\ln(ml_{it}) = \alpha + \beta \ln(mc_{it}) + \varepsilon_{it} \quad [3]$$

In this case,  $ml_{it}$  – represents the share of i bank in the credit market for the t period. At the same time, the bank's share in the credit market was calculated in the form of the ratio of bank loans to loans issued by all banks. Here, too, the expected sign of the marginal cost ratio was negative, and its increase should reduce the bank's share in the credit market in conditions of intense competition. This was because the increase in bank costs should also increase the cost of credit. An increase in the cost of credit would lead to customers leaving the bank in a highly competitive environment.

Under conditions of intense competition, coefficient  $\beta$  would continue to grow in absolute value. In practice, the "Bun" indicator had been found to be particularly useful for studying the competitive environment in developing countries (F. Leon, 2014; Florian Leon, 2015). Because this method only required statistics on profits (or market share) and costs. Also, one simple linear econometric Model was sufficient to evaluate the "Bun" indicator.

In assessing this indicator, the marginal cost of each bank would be required. Costs widely used in the scientific literature estimate marginal costs based on the translog function (Berg & Kim, 1994; Berger, Klapper, & Turk-Ariss, 2017; Fernandez de Guevara, Maudos, & Perez, 2005; Horvath et al., 2016; Shaffer, 1993).):

$$\begin{aligned} \ln(TC_{it}) = & \alpha + \beta_1 \ln TA_{it} + \frac{1}{2} \beta_2 \ln^2 TA_{it} + \sum_{j=1}^3 \gamma_j \ln w_{jit} + \frac{1}{2} \sum_{j=1}^3 \sum_{k=1}^3 \gamma_{jk} \ln w_{jit} \ln w_{kit} \\ & + \frac{1}{2} \sum_{j=1}^3 \psi_j \ln TA_{it} \ln w_{jit} + \theta_1 T + \frac{1}{2} \theta_2 T^2 + \kappa \ln TA_{it} T + \sum_{j=1}^3 \rho_j \ln w_{jit} T \\ & + \varepsilon_{it} \end{aligned} \quad [4]$$

Where  $\ln(TC_{it})$  – the logarithm of total expenses,  $\ln TA_{it}$  – the logarithm of the total assets of the i bank in period t,  $\ln w_{jit}$  was the logarithm of the cost of type j of the i bank in period t, and T was the time trend in the banking system.  $\alpha, \beta, \gamma, \psi, \theta, \kappa, \rho$  were econometrically estimated coefficients, and  $\varepsilon_{it}$  was the statistical error. After evaluating the above Model, the marginal cost calculated as follows:

$$mc_{it} = \frac{TC_{it}}{TA_{it}} \left[ \beta_1 + \beta_2 TA_{it} + \sum_{j=1}^3 \gamma_j \ln w_{jit} + \kappa T \right] \quad [5]$$

Total expenses (TC) consist of wages and equivalent payments, and other operating expenses. Total assets  $TA_{it}$  was the total assets on the balance sheet of banks. Expenditure costs were also divided into three types: the cost of borrowed funds ( $w_1$ ) - the ratio of total interest expenses to total liabilities, the cost of fixed assets ( $w_2$ ) - the ratio of other operating costs to total fixed assets, labour costs ( $w_3$ ) - proxy labour costs, the ratio to assets obtained. The time trend (T) also added to the Model as a control variable.

**ASSESSMENT OF THE COMPETITIVE ENVIRONMENT IN THE BANK MARKET OF UZBEKISTAN  
THROUGH "BUN" INDICATOR**

The observations were made based on unbalanced statistics of banks operating in the banking market of Uzbekistan in 1999-2018. The following table provided descriptive statistics of the variables.

**Table 1 Flexible descriptive statistics**

Flexible	Observations	Minumum	Std.T-test.	Minimum	Maximum
$ln(TC_{it})$	536	16,30	2,22	8,70	25,89
$lnw_{1it}$	537	-1,44	1,37	-8,59	5,14
$lnw_{2it}$	531	-0,69	0,85	-3,20	4,46
$lnw_{3it}$	532	-0,25	0,78	-3,70	1,97
$ln(TA_{it})$	541	-1,93	2,27	-8,50	3,35
$ln(ms_{it})$	541	-4,77	1,86	-10,13	-0,25
$ln(\pi_{it})$	516	14,94	2,13	8,03	20,10
$ln(ml_{it})$	537	-5.36	1.86	-10.13	-0.25

The source of statistical data was the financial statements published by the newspaper "Bank Information" and based on commercial banks financial reports. All financial indicators presented in national currency soums and expressed in thousand units. Also, because actual prices represented the real situation more accurately, all variables were adjusted to the real situation compared to 2008 prices.

**RESULTS**

In the evaluation of the above Model [1], [2] and [3], the fixed effects method used to take into account the quantitatively underestimated diversity of banks. However, in addition to the Fixed effects (FE) method, the cumulative Least-squares method (LSM) and Random effects (RE) methods were also used to determine how low the statistical data were and how robust the model results were. Regression analysis was performed in two different forms using Models [1], [2] and [3] to study monopolization in the banking market. First, a general period for analyzing the monopolist in the banking system in 1999-2018 and regression was carried out with all banks. Second, regression was performed over the years to determine how much the monopolization had changed over the years. The table below showed the regression results for all banks and periods.

**Table 2 Regression results**

	LSM	FE	RE
Subordinate variable – $ln(\pi_{it})$			
$ln(mc_{it})$	-0.82***(0.20)	-0.03(0.20)	-0.22(0.18)
R-squared	0.09	0.37	0.37
Observation quantity	506	506	506
Subordinate variable – $ln(ms_{it})$			
$ln(mc_{it})$	-0.84***(0.19)	-0.27*(0.15)	-0.30**(0.15)
R-squared	0.13	0.26	0.26
Observation quantity	529	529	529
Subordinate variable – $ln(ml_{it})$			
$ln(mc_{it})$	-0.27 (0.19)	-0.09 (0.17)	-0.11 (0.17)

R-squared	0.01	0.02	0.02
Observation quantity	527	527	527
Number of banks	45	45	45

\*\*\* 1% Statistical significance

\*\* 5% Statistical significance

\* 10% Statistical significance

## DISCUSSION

According to the regression results, the marginal cost coefficient had a negative sign in all model specifications, but not all were statistically significant. A value was close to or equal to zero meant that the banking market monopolized.

In the model [2], all coefficients were statistically high, although weak. This results in banks competing for market share. The fact that the value of the coefficients was close to zero meant that there was weak competition. According to the results obtained based on the fixed effect method, a 1% increase in marginal costs reduced banks' market share by an average of 0.27%.

Although all coefficients in the Model [3] were negative, they were not statistically significant. A 1% increase in marginal costs would not affect banks' share of the credit market. This was because banks did not compete to provide credit resources and banks had monopoly power. The high market value of credit resources might be due to a strong monopoly. Also, the provision of financial resources by the government based on state programs to banks specializing in a particular field without any competition and tenders led to the strengthening of the monopoly in the market.

Regression performed over the years to determine how monopolization had changed over the years. Due to the lack of statistical data, the least-squares method chosen for econometric evaluation. It was clear from the instability of the results that the competitive environment in the market did not have long-term stability. The main reason for this might be since many reforms had been carried out in the banking system over the years. Although the ratios were negative, many ratios were not statistically significant. In 2000, all coefficients were the highest in absolute value and statistically significant.

According to this indicator, the closer the marginal cost ratio to zero, the greater the monopoly power in the market. An increase in monopoly power reduced the profitability of banks to marginal costs to such an extent. An increase in marginal cost did not reduce profit because banks could increase price using monopoly power.

Based on the results of the regression based on the above three models, it could be seen that the competitive environment in the banking market had not changed dramatically over the years. Over the years, according to the analysis of the Model [2], between 2006 and 2012, interbank competition increased slightly, and the coefficients were statistically significant during these periods. An increase of 1% in marginal costs during this period reduced the average market share of banks by 1.16%.

According to the competitive analysis in the credit market, this market strongly monopolized during the analysis period. Because the coefficients in the first part of the analysis period were statistically significant, the results were not statistically significant in subsequent years. It could conclude that banks had not lost their share of the credit market due to the increase in the cost of loans resulting from a 1% increased in marginal costs.

### Table 3

**ASSESSMENT OF THE COMPETITIVE ENVIRONMENT IN THE BANK MARKET OF UZBEKISTAN  
THROUGH "BUN" INDICATOR**

**Regression results**

Years	$\beta - Model[1]$	$\beta - Model[2]$	$\beta - Model[3]$
1999	-0,52(1,26)	-1.05 (0.81)	-1.86* (0.98)
2000	-2,46*** (0,81)	-2.38*** (0.75)	-2.30** (0.83)
2001	-0,67*** (0,26)	-0.73** (0.27)	-0.47 (0.36)
2002	-0,27(0,41)	-0.41 (0.59)	-0.26 (0.62)
2003	-0,27** (0,08)	-0.96 (0.77)	-0.52 (1.01)
2004	-0,67(0,79)	-1.30* (0.72)	-0.57 (1.02)
2005	-0,18(0,42)	-0.34(0.55)	0.11 (0.74)
2006	-1,80** (0,76)	-1.18* (0.67)	0.02 (1.01)
2007	-1,07** (0,50)	-1.45*** (0.49)	-0.76 (0.74)
2008	-0,94** (0,37)	-0.91** (0.38)	0.05 (0.61)
2009	-1,08** (0,47)	-1.06** (0.45)	0.33 (0.99)
2010	-1,10(0,81)	-1.09*** (0.39)	0.53 (0.87)
2011	-0,54(0,34)	-1.25*** (0.38)	-0.05 (0.85)
2012	-1,24* (0,63)	-1.18** (0.49)	-0.44 (0.83)
2013	-0,95(0,66)	-0.95 (0.59)	0.26 (1.03)
2014	0,29(0,19)	0.17 (0.32)	0.47 (0.31)
2015	-0,94(0,58)	-0.85 (0.66)	0.16 (1.13)
2016	-0,71* (0,38)	-0.83* (0.44)	-0.01 (0.73)
2017	-0,59(0,50)	-0.53 (0.50)	0.50 (0.99)
2018	-0,71(0,79)	-0.71 (0.67)	0.26 (1.14)

\*\*\* 1% Statistical significance

\*\* 5% Statistical significance

\* 10% Statistical significance

After 2012, there was a short-term decline in the monopoly power of banks, but it began to rise again. Especially after the increase in short-term monopoly power in 2017, the competitive environment in the interbank market intensified in 2018. The change in the competitive environment after 2016 could be explained by the fact that some state-owned banks had been injected with capital again, and the banking system had been liberalized. The elimination of cash problems and the lifting of currency restrictions might contribute to the increased interbank competition. This was because banks were competing to provide services to the population and exchange currency through ATMs.

**CONCLUSION**

The following conclusions drawn during the research:

1. The non-structural method of competition assessment was used in the scientific work to analyze the competitive environment in the banking system of Uzbekistan. In particular, based on the Bun indicator (Boone, 2001, 2008, 2014), interbank competition in the general banking system, according to the form of ownership of banks and over the years, was evaluated empirically.
2. According to the analysis conducted based on this indicator for 1999-2018, the monopoly power of banks in the banking system of Uzbekistan was significantly higher. It also empirically approved that banks' market share in assets was more sensitive to marginal costs. Banks' market share in terms of credit resources was not affected by marginal costs, and banks had a firm monopoly

position in the credit market. This, in turn, led to an increase in the cost of commercial credit resources.

3. According to the analysis conducted over the years, the interbank competition intensified, albeit slowly, over time. It could be said that the capitalization of existing banks and the liberalization of the banking market had played an essential role in improving the competitive environment. Therefore, to develop competition in the banking market, it was necessary to accelerate reforms to liberalize the banking system.

4. In addition, while increasing the capital of state-owned banks would increase interbank competition in the short term, in the long run, such an unequal relationship would lead to a deterioration of the competitive environment in the banking market.

### **CONFLICT OF INTERESTS AND CONTRIBUTION OF AUTHORS**

The authors declare the absence of obvious and potential conflicts of interest related to the publication of this article and report on the contribution of each author.

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**ASSESSMENT OF THE COMPETITIVE ENVIRONMENT IN THE BANK MARKET OF UZBEKISTAN  
THROUGH "BUN" INDICATOR**

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