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Sh.G. Jumadilova¹, B.Zh. Atabay²¹International Information Technology University, Almaty, Kazakhstan;²Almaty University of Power Engineering and Communication, Almaty, Kazakhstansh.jumadilova@iitu.kz, begeibek@gmail.com**DYNAMICS OF THE POPULATION SAVINGS IN KAZAKHSTAN**

Abstract. The paper investigates dynamics of population savings and factors affecting it. Dynamics of population savings were measured by individuals' savings. As potential factors average salary, exchange rate and interest rate for both tenge deposits and deposits in foreign currency were taken. With significant factors identified, respective regression model was developed. It was justified the relationship between total individuals' deposits and average trimmed salary, total individuals' deposits and currency rate. Structural analysis and analysis of dynamics were used to compare the changes in components of total deposits. The results show a positive trend in individuals' deposits in tenge rather than in USD. For research purpose statistical data for 2010-2017 years was used. Moreover, effect of entering Kazakhstan Deposit Insurance Fund on the size of deposits was studied. Among research results unexpected one was that interest rate for deposits and deposits size are not interrelated. Deposits are considered as one of the sources for investments into economy. Therefore, some predictions on deposit size for coming years are done. Conclusion summarizes main research results.

Keywords: population savings, individuals' savings, deposits, deposit insurance, Kazakhstan Deposit Insurance Fund.

Introduction. The issue of increasing population's savings is one of the significant research problems. There are several studies made by different scientists. Some recent ones among them are [1, 2]. This paper differs from them by investigating factors affecting population's savings via regression analysis.

There are many researches on effects of deposit insurance, mainly investigating whether it promote banking industry stability or moral hazard [3,4]

Jameaba [5] analyzed the effects of the establishment of the Indonesia Deposit Insurance Corporation (IDIC) and found a shift in the composition of bank deposits from time deposits and demand deposits to savings deposits. Since Kazakhstan entered KDIF as well, paper raises a question about effects of it on deposits.

Concerning the case of Kazakhstan, in recent years, especially since global financial crisis, when almost every country's economy collapsed, the fact that deposit insurance plays a crucial role in maintaining financial stability and promoting safe banking system has been recognized.

Since the early 90's more than 113 countries have adopted an explicit deposit insurance system [6]. The Republic of Kazakhstan was not an exception and KDIF (Kazakhstan Deposit Insurance Fund) was established in 15 November, 1999 back then called "Incorporation of ZAO "Kazakhstan Individuals Deposit Guarantee (Insurance) Fund".

Types of bank deposit accounts are current deposit accounts, savings account, and time deposit accounts. Deposit Insurance is protection provided usually by a government agency to depositors against risk of loss arising from failure of a bank or other depository institution. Deposit insurance is mandatory in Kazakhstan, and pays claims from a pool of funds to which every depository institution regularly contributes. However, it covers only a fixed maximum amount per account holder.

Kazakhstan Deposit Insurance Fund (KDIF) was established with a view to building confidence in the Kazakhstani banking system as a framework of protection of bank deposits of general public. This issue became critical for the Republic of Kazakhstan after the financial crisis of 1998 burst in Russian Federation [7]. KDIF is a non-profit organization. National (Central) Bank of the Republic of Kazakhstan is the founding institution and the sole shareholder of KDIF.

The basic objective of deposit insurance system is to maintain stability of financial system, including via maintaining public confidence in Kazakhstani banking sector via establishing the framework to reimburse bank depositors in the event of a Deposit Insurance System (DIS) member bank failure.

During 18 years of work, several changes happened in rules of KDIF, which consequently affected the dynamics of deposits in banks of Kazakhstan. The main purpose of this paper is to explain the work of deposit insurance system in the Republic of Kazakhstan, analyze the changes in the number of savings in frequent years using the models to determine the factors which affect savings decisions of individuals and non-banking legal entities and come to the suggestive conclusions.

Methodology and data. In this paper, as population's savings, deposits are taken for following reasons: no access to statistics of investments volume; existence of non-registered savings (for example, people tend to keep their savings under bed, it was common back then and still exists, especially amongst elder generation); big range of possible savings placements which does not allow to cover them all.

Research results are derived using the software MS Excel. To find the relationships between deposits' size and affecting factors such as salary, interest rate and exchange rate scatter diagrams were plotted and further multiple regression analysis was implemented with construction of respective regression model. Comparative analysis between indicators for 2010-2017 was done. Since the main theme is dynamics of individuals' deposits, as for dependent variable total volume of individuals' deposits in measurement of million tenge was taken for each segment of analysis. As independent variables were taken average trimmed salary of individuals' (in tenge), average policy of exchange rate (dollar to tenge), annual interest rate (in %) for deposits. To find the tendency of changes over time linear, exponential and polynomial lines were used as a tool for visual interpretation. Structural analysis was used to compare the changes in components of total deposits. For analysis 2010-2017 years' statistics was used. As for KDIF and deposits' relationships analysis, dummy variables as an alternative for existence/non-existence were taken.

Research Results. According to the Law of the Republic of Kazakhstan "Regarding amendments and additions to several legislative acts of Kazakhstan on strengthening protection of property rights, providing guarantees for protecting contractual obligations and toughening liability for their violation", the deposit insurance coverage limit applied to deposits in national currency increased from 5 million to 10 million tenge. The coverage limit for deposits in foreign currency was retained on the same level of 5 million tenge.

The deposit insurance coverage limit extended to any bank deposit or bank account of a single depositor in any single bank shall comprise:

For deposits and bank accounts in tenge: 10 million tenge;

For deposits and bank accounts in any foreign currency: 5 million tenge (in equivalent, at the exchange rate as of the date of enactment of the court resolution governing forced liquidation of deposit insurance system member bank).

Table 1 - Structure of total individuals deposits

	Individuals Deposits, end of period, mln.KZT						
		including individuals demand deposits and current accounts		including individuals deposits		including individuals time deposits	
Year	Total	national currency (DDCA)	foreign currency (DDCA)	national currency (ID)	foreign currency (ID)	national currency (ITD)	foreign currency (ITD)
2009	1 717 478	163 369	67 760	2 332	1512	542 825	939 681
2010	2 075 849	210 333	61 885	3 414	1029	851 293	947 896
2011	2 488 131	262 597	52 626	7 801	1114	1 157 829	1 006 163
2012	3 056 481	332 466	61 907	7 260	5 533	1 449 339	1 199 978
2013	3 663 105	378 141	64 926	16 561	6 041	1 739 245	1 458 190
2014	4 292 262	384 646	91 950	23 401	7 857	1 503 762	2 280 645
2015	5 033 513	345 903	135 129	11 841	20 135	1 027 059	3 493 446
2016	7 233 730	433 710	198 181	7 412	18 735	1 745 814	4 829 878
2017	7 895 994	536 324	196 009	6 764	16 111	2 896 707	4 244 077

Source: [8-11]

Two following pie-charts describe components of deposits by type visually. To distinguish changes over time, data from 2009 and 2017 are compared (Figures 1 and 2).

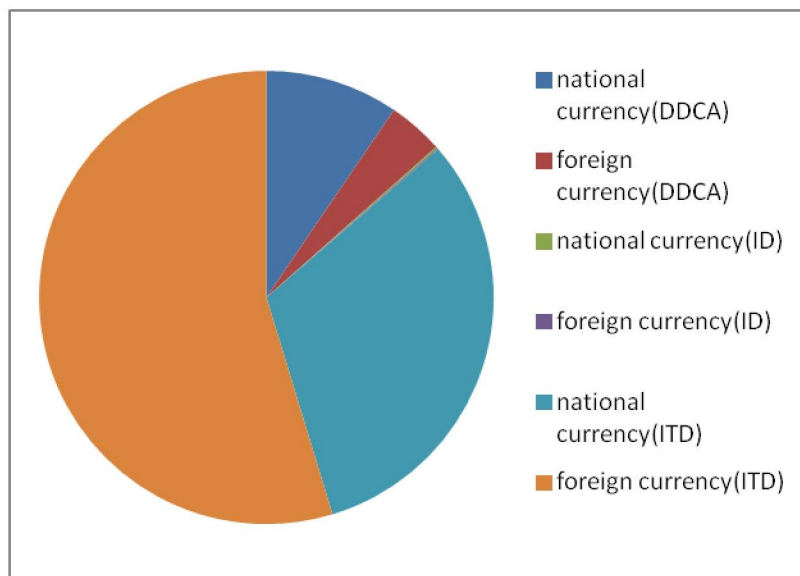


Figure 1 - Structure of deposits of individuals in 2017

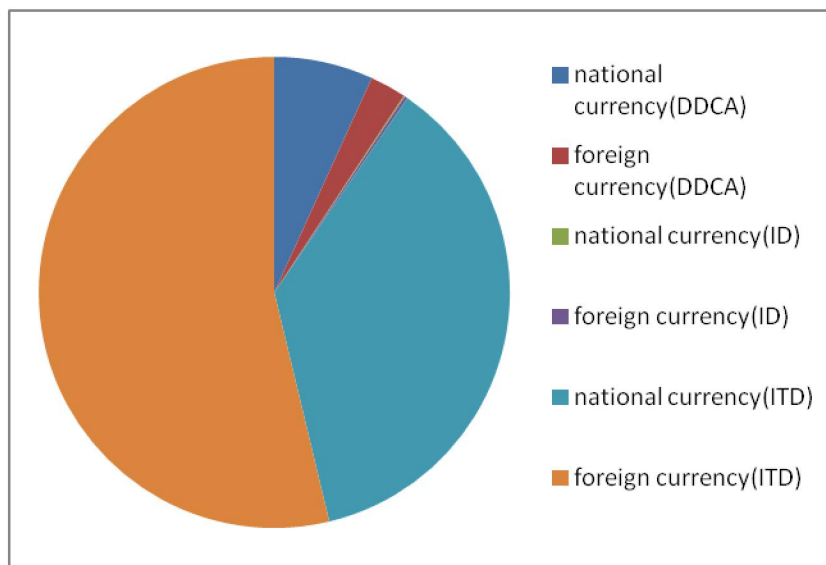


Figure 2 - Structure of deposits of individuals in 2017

From pie-chart, it can be seen that in both 2009 and 2017 individual time deposits (ITD) in both foreign and national currency took lion's share: 87% and 91% respectively. Demand deposits (DDCA) were less popular: 13% in 2009 and 9% in 2017 (including deposits in both currencies). Other types of individuals' deposits (ID) were least popular: 2% in 2009 and 0% in 2017. It can be concluded that time deposits are becoming more popular, replacing other deposits.

Deposits in foreign currency were more in volume rather than in national currency. In 2009, 59% of deposits' size was in foreign currency, whereas 56% was an indicator for 2017. However, it can be concluded that savings in national tenge are slowly becoming more demanded.

The following graphs illustrate overall dynamics of deposits of individuals in Kazakhstan by its type in 2009-2017 (Figure 3).

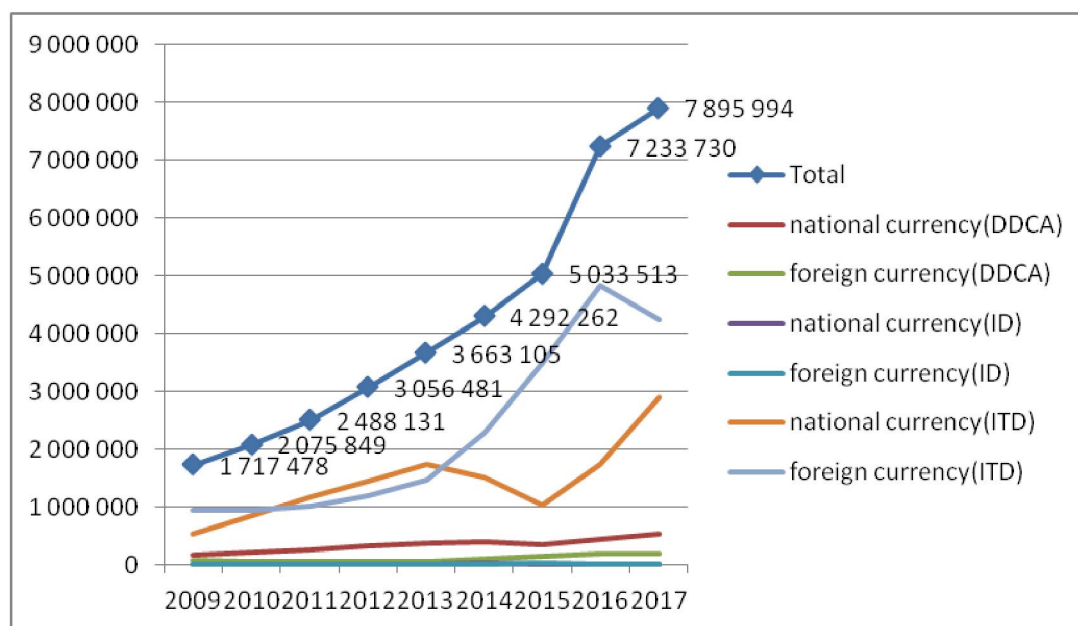


Figure 3 - Dynamics of individuals' deposits in Kazakhstan by type in 2009-2017

According to the information from the official internet resource of NBRK, as for individual's savings, there's been a continuous increase over time. The number of deposits grew moderately in a period from 2009 until 2015, varying with the difference from year to year. Sharp increase was from 2015 to 2016.

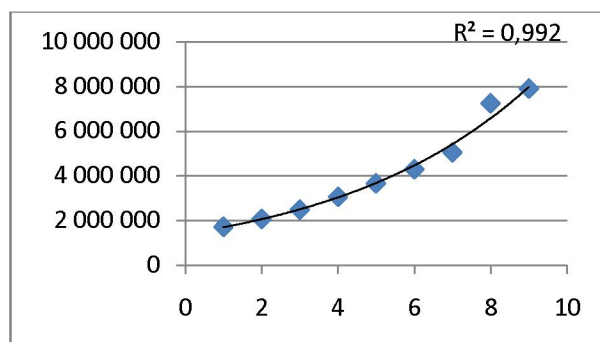


Figure 4 - Trend in dynamics of individuals' savings

As seen from Figure 4, the dynamics of individuals' savings are better explained with exponential curve rather straight line. R^2 value of 0.9927 is an evidence of good fit. Whenever x increases by 1, the estimate from an exponential curve increases by the same percentage. As a result, we'll find that the estimate of deposit's growth rate is 21.32%.

According to the historical tendency of growth, estimated total for 2018 is 9 661 434.89 mln tenge and for 2019 is 11 721 288.09 mln tenge. Overall, deposits are tended to rise from year to year. However, although exponential growth was used for deposits since in a total it tended *only* to grow over time, it's better to remember that exponential growth cannot last forever and further linear relationships might be better fit.

Are volume of deposits and average salary of individuals interrelated?

Major part of individual's income comes from their salary. Therefore, there is a point to say, that deposits' dynamics strongly related to average salary. As for salary indicator, we trimmed the highest and the lowest values, and then got average salary. Total individuals deposits averaged in a year and average trimmed salary are given in Table 2.

Table 2 - Total individuals deposits and average trimmed salary

		Total individuals deposits (mln tenge)	Average trimmed salary (tenge)
1	2010	2075849	77609.95
2	2011	2488131	89800.54
3	2012	3056481	101304
4	2013	3663105	107898
5	2014	4292262	119374
6	2015	5033513	124138.2
7	2016	7233730	141417.1
8	2017	7895994	144070.6

At first, let us draw a scatterplot for the data above (Figure 5).

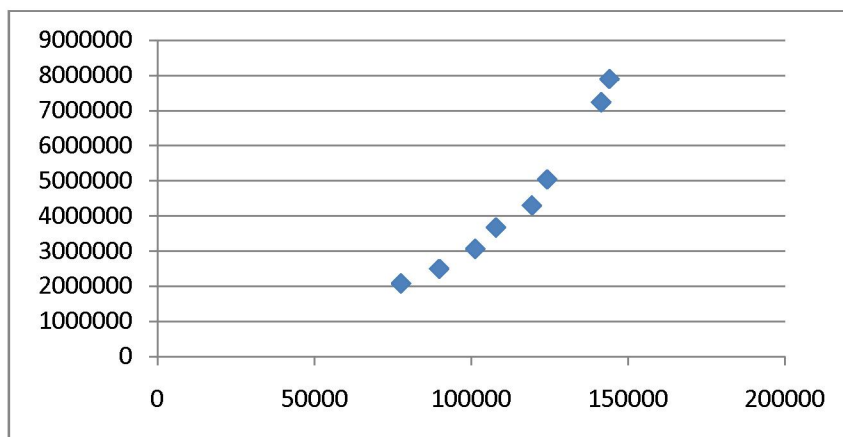


Figure 5 - Scatterplot of total individuals' deposits and average trimmed salary

From Figure 5 one can see obvious relationship between total individuals' deposits and average trimmed salary. Since total individuals' deposits shows strong dependence on average trimmed salary, let us investigate changes in salary over time. Tendency of changes in salary over time is straight line upward trend. So, we can use trend equation to predict salary in coming year.

Exchange rate and deposits

Now, let us study other factors affecting deposits in Kazakhstan. Since one of the main factors in people's decision-making is currency rate of US dollar to tenge, consider whether people tend to save more with increase in currency rate or not. Respective scatterplot is shown in Figure 6.

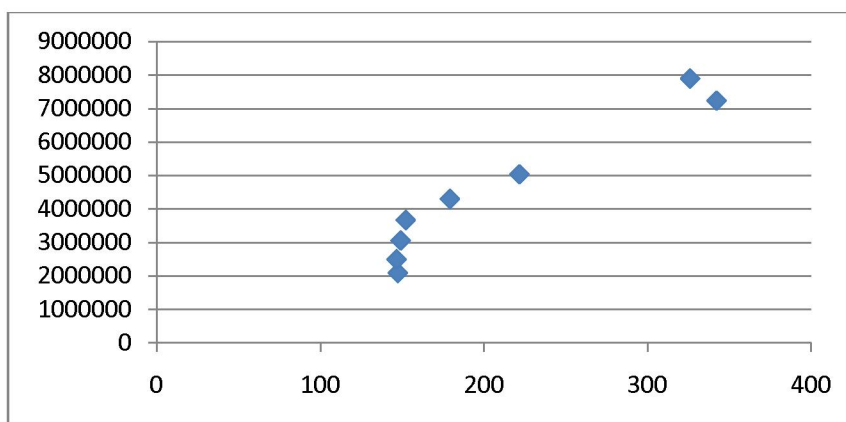


Figure 6 - Scatterplot of total average individuals' deposits and currency rate (tenge per 1 USD)

For the prediction purpose we can determine a trend equation for currency rate. However, even historical evidences prove that there is a tendency in changes of interest rate, in a reality it is not so common, because lots of external and internal factors/events may affect exchange rate so, that it may change sharply and unexpectedly. For example, in 2015 as a result of decrease in a price of oil, tenge was released into free floating; consequently it depreciated from 179 to 222 tenge per dollar. This kind of changes cannot be precisely predicted. Thus, it is better to remember that estimations on future exchange rate sometimes might be of little use.

Interest rate and deposits

As is known, higher (lower) interest rates should provide higher (lower) demand for deposits. However, in practice, there is no enough strong relations for estimation. Since all data below was for individuals, whereas volume of deposits include both individuals and non-banking entities, it is fair to use non-banking entities' deposits now. For savings in national currency, historically situation was as follows in Table 3.

Table 3 - Deposits of non-banking legal entities and their annual interest rate

Years	Deposits of non-banking legal entities (tenge)	Interest rate, % (for tenge deposits)	Deposits of non-banking legal entities (in foreign currency)	Interest rate, % (for deposits in foreign currency)
2010	3361736	3.5	1777908	1.9
2011	4079784	3	1589773	0.6
2012	4318377	2.8	1618494	2.1
2013	4232794	3	1959158	2.4
2014	4281506	4.8	3102694	1.8
2015	3871123	11.1	3935523	2.4
2016	4699694	29.3	5225517	2.5
2017	5538119	10.4	4330039	1.8

The next scatter diagrams show that there is no relationship neither between deposits of non-banking legal entities in tenge and annual interest rate for tenge deposits (Figure 7) nor between deposits of non-banking legal entities in foreign currency and annual interest rate for deposits in foreign currency (Figure 8).

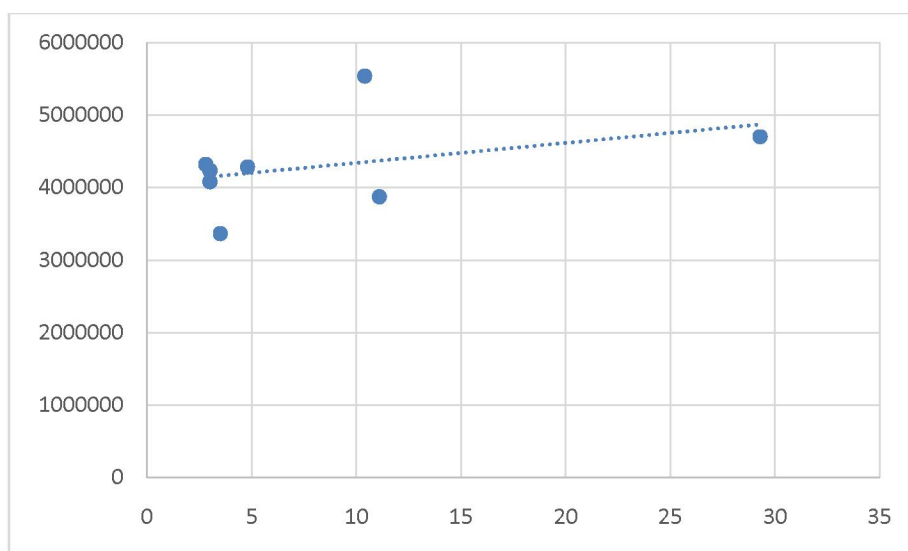


Figure 7 - Scatterplot between deposits of non-banking legal entities in tenge and Interest Rate

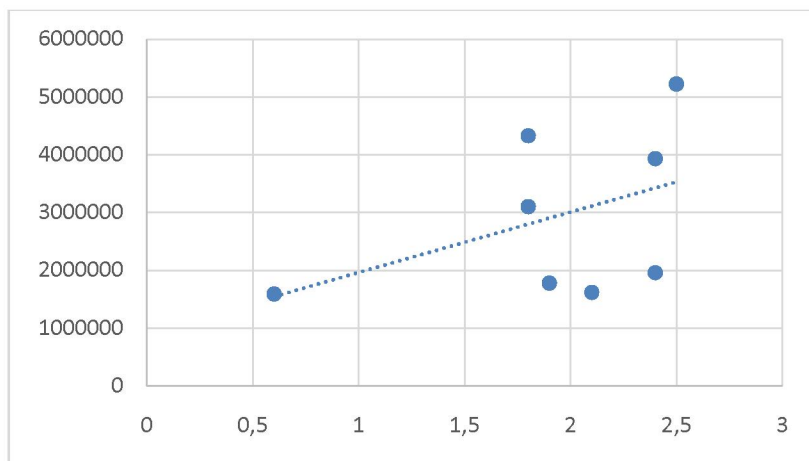


Figure 8 - Scatterplot between deposits of non-banking legal entities in foreign currency and Interest Rate

We can conclude interest rate had no effect on volume of deposits during 2010-2017.

KDIF and deposits

Since KDIF provides insurance for deposits, there is a point to say that after establishment of such service trust of nation for banks' safety increased. Compare dynamics of deposits before and after KDIF (Table 4).

Table 4 - Dynamics of individuals' deposits before and after KDIF

	KDIF existence	Volume of individuals' deposits	Growth rate
1998	no	31039	
1999	no	39701	27.91%
2000	yes	72128	81.68%
2001	yes	141810	96.61%
2002	yes	219836	55.02%

Since KDIF was established at the end of 1999, we've decided to define it as 'did not exist' for this year for more accurate outcome. As a result, we can notice sharp increase after KDIF establishment. Before KDIF growth was only 27.91%, whereas after KDIF it was 81.68%, 96.61%, 55.02% in 2000, 2001 and 2002 correspondingly. Overall, we can say, that volume of deposits rose once KDIF was established.

Factors affecting deposits' size

If we combine all significant factors which were identified above, multiple regression model can be developed and it is as follows:

$$\text{Predicted deposits} = -3631848 + 47.5914 * (\text{Average salary}) + 13035.32 * (\text{Average exchange rate}) \quad (1)$$

$$R^2 = 0.9888$$

$$S.E. = 268254.$$

According to p-value, we can say, that both independent variables are useful (p-value for salary is 0.0037, for exchange rate 0.0046).

Therefore, predicted value for volume of deposits in 2018 is 9 444 867 mln kzt and in 2019 is 11 085 376 mln kzt.

Conclusion

From the research one can conclude the following:

1. Time deposits have been the most popular. Deposits in foreign currency are still dominant in the market, but deposits in tenge slowly becoming stronger and demanded.

2. Despite of market conditions, deposits' volume tend to *only* grow over previous 10 years with an estimate growth rate of 21.32%.

3. Average salary and volume of deposits are interrelated. Growth in salaries of individuals causes willingness of individuals to save more.

4. Currency rate and volume of deposits are also interrelated. Historically, several depreciations happened in value of tenge. However, it influenced positively the growth of population's savings.

5. Establishment of KDIF definitely influenced on growth positively, increasing trust of individuals for banking system of Kazakhstan.

6. During research was found out surprisingly that interest rate of banks attracted deposits and deposits by itself are not interrelated. Changes in interest rate do not influence volume of deposits.

7. In conclusion, overall estimation for 2018 deposits based on several facts, vary from 9295211.88 to 10127057.64, whereas for 2019 it is between 11085376 and 12417227.64.

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ДИНАМИКА СБЕРЕЖЕНИЙ НАСЕЛЕНИЯ В КАЗАХСТАНЕ

Аннотация. В статье исследуется динамика сбережений населения, а также факторы, влияющие на них. Динамика сбережений населения измерялась сбережениями физических лиц. В качестве потенциальных факторов была принята средняя зарплата, обменный курс и процентная ставка как по депозитам в тенге, так и по депозитам в иностранной валюте. При выявленных значимых факторах была разработана соответствующая регрессионная модель. Было подтверждено соотношение между депозитами физических лиц и средней урезанной зарплатой, депозитами физических лиц и курсом валют. В целях сравнения изменений компонентов всех депозитов были применены структурный анализ и анализ динамики. Результаты показывают положительную динамику депозитов физических лиц в тенге, нежели в долларах США. Для целей исследования использовались статистические данные на 2010-2017 годы. Кроме того, изучался эффект внедрения Казахстанского фонда страхования вкладов на объем депозитов. Среди результатов исследования неожиданным было то, что процентная ставка по депозитам и объем депозитов не взаимосвязаны. Депозиты

считаются одним из источников инвестиций в экономику. Поэтому были сделаны некоторые прогнозы по объему депозитов на ближайшие годы. Заключение обобщает основные результаты исследований.

Ключевые слова: сбережения населения, сбережения физических лиц, депозиты, страхование вкладов, Казахстанский фонд страхования вкладов

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ҚАЗАҚСТАНДАҒЫ ХАЛЫҚТЫҢ ЖИНАҚТАРЫНЫҢ ДИНАМИКАСЫ

Аннотация. Мақалада халықтың жинақтарының динамикасы, сондай-ақ оларға ықпал ететін факторлар қарастырылады. Халықтың жинақтау динамикасы жеке тұлғалардың жинақ ақшасымен өлшенді. Теңгедегі де, шетел валютасындағы да депозиттер бойынша ықтимал факторлары ретінде орташа жалақы, айырбас бағамы мен пайыздық мөлшерлеме қабылданды. Белгіленген маңызды факторлармен тиісті регрессиялық модель әзірленді. Жеке тұлғалардың депозиттері мен орташа айлық жалақының, жеке тұлғалардың депозиттері мен айырбас бағамдарының арасындағы арақатынас расталды. Барлық депозиттер құрамдас бөліктеріндегі өзгерістерді салыстыру үшін құрылымдық талдау және динамикалық талдау қолданылды. Нәтижелер АҚШ долларымен емес, теңгедегі жеке тұлғалардың салымдарының өсу динамикасын көрсетті. Зерттеу мақсатында 2010-2017 жылдарға арналған статистикалық деректер пайдаланылды. Бұдан басқа, қазақстандық депозиттерге кепілдік беру қорын енгізуінің депозиттердің көлеміне әсері зерттелді. Зерттеу нәтижелері бойынша депозиттер сыйақы мөлшерлемесі және депозиттердің көлемі өзара байланысты емес болып шықты. Депозиттер экономикадағы инвестиция көздерінің бірі болып саналады. Соған орай, жақын болашақта депозиттердің көлемі бойынша кейбір болжамдар жасалды. Зерттеудің негізгі нәтижелері қорытынды бөлімінде баяндалған.

Түйін сөздер: халықтың жинақ ақшасы, жеке тұлғалардың жинақтары, депозиттер, салымдарды сақтандыру, қазақстандық депозиттерге кепілдік беру қоры

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