

An Empirical Study on the Development Motivation of Structured Deposits

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Abstract: Based on the monthly data from 2017 to 2018, this paper empirically tests the development motivation of structured deposits on the basis of theoretical analysis. The research shows that there is an inverse correlation between customer demand for structured deposits and stock market returns, a positive correlation between structured deposits and bond market returns, and a reverse correlation between structural deposits and property market returns; the correlation between market interest rate, market liquidity, inflation and structural deposits is not significant. The introduction of the new asset management regulations in 2018 requires that rigid payment be broken, and financial products no longer protect capital and income, which greatly promotes the development of structured deposits. The increasing pressure on commercial banks to absorb deposits also promotes the development of structured deposits.

1. Introduction

After the release of the draft of the new asset management regulations in 2018, the development of wealth management business in the banking system is facing reshaping. Under the influence of a series of measures, such as breaking the firm exchange, banning the capital pool and promoting net worth management, the growth of the source of bank wealth management funds has gradually slowed down. Structured deposits, as a substitute for wealth management products, have begun to attract market attention, and have gradually become the main source of funds for banks to put in assets. At the same time of the rapid development, the problems faced by structured deposits begin to highlight, which have an impact on the market and the operation of banks to a certain extent. In view of this, this paper firstly combs the characteristics of structural deposits in China, on this basis, combined with statistical data to analyze the current situation of structural deposits, and then discusses the motivation of the rapid development of structured deposits. Empirical research is carried out on the basis of theoretical analysis. Finally, the problems of structured deposits and the impact of the new regulations on structured deposits are analyzed.

1.1 The Definition and Characteristics of Structured Deposits

Structured deposits refer to the deposits which embedded in financial derivatives absorbed by financial institutions, linked to the fluctuations of interest rates, exchange rates, indices, etc., or to the credit situation of an entity. The structured deposit is a combination of general deposits and financial derivatives which is usually options. After the release of structured deposits, banks mainly use funds for two parts, one is to generate fixed income for loans, and the other is to invest in high-risk financial products, which generate much higher returns than fixed income. The income obtained by the purchasers of structured deposits also comes from these two aspects, one is fixed income, which is generally less; the other is the high return from investing in high-risk projects, and this part of customers get higher returns and higher risks.

In terms of income, the interest rate of structured deposits is much higher than that of ordinary time deposits, the interest rate of structured deposits is generally about 4%, and the return of structured deposits is much higher than that of ordinary time deposits. In terms of flexibility, the

term structure of structured deposits is more flexible, and commercial banks dominate structured deposits. In terms of risk, structured deposits belong to the business of on-balance sheet accounting, and the internal risk rating of banks is relatively low. Therefore, in the internal risk rating of banks, the risk rating of structured deposits is lower.

1.2 Literature Reviews

Structural deposits are affected by many factors. Wenhui Ye (2018) pointed out that structural deposits have increased rapidly since 2017, because the introduction of new regulations on asset management in 2018 has broken the 'rigid payment' which means financial products no longer protect capital and income, and structured deposits have become an effective substitute for financial products. Secondly, commercial banks are facing great deposit pressure, commercial banks have to actively develop structured deposit products to alleviate deposit pressure. Finally, the return of structured deposits is higher, and the risk is within the scope of customers' tolerance, which meets the requirements of customers. The research of some scholars supports the above point of view. Wei Song and Guang Yang (2018) analyzes the reasons for the rapid development of structured deposits, one is the impact of the new regulations on asset management, and the other is that commercial banks ease the debt pressure, which is consistent with Ye's analysis.

In terms of internal structure, deposit pressure has a greater impact on small and medium-sized banks, and small and medium-sized banks pay more attention to structured deposits, and the overall scale of structured deposits is higher than that of large banks. Data in recent years show that structural deposits in Chinese-funded small and medium-sized banks grow faster than large banks, and small and medium-sized banks account for a higher proportion of structural deposits (Wei Song and Guang Yang, 2018; Feipeng Lou, 2018).

There are many problems with structured deposits. In terms of positioning, the positioning of structured deposit products is vague. In the normative aspect, the sales of structured deposits are not standardized, and the accounting methods and operation modes of structured deposits are also different in different financial institutions. In terms of publicity, the propaganda of structured deposits is inconsistent, which is difficult for customers to tell whether structured deposits are real or not. Guangyu Wang (2018) also analyzed the problems of structured deposits, pointing out that the current structured deposit market is not standardized and structured deposits are highly volatile in season. Customers lack the understanding of structured deposits, and the supervision of commercial banks by financial regulatory departments needs to be strengthened. There are certain risks in structured deposits. Jian Qiu analyzed and pointed out the market risks, credit risks and operational risks of structured deposits (Zenghe Cao and Xianzhong Fan, 2018; Feipeng Lou, 2018).

For the future development trend of structured deposits, in the short term, structured deposits can effectively alleviate the deposit pressure of commercial banks; in the long run, the growth of structured deposits will become slow (Yan Liu and Jie Liu, 2018). Some scholars have made a distinction between the broad sense and the narrow sense of structured deposits, pointing out that the 'true' structured deposits still need a long process of development (Xuyang Gao, 2018). Feipeng Lou (2018) believes that although there are some problems with structured deposits, there is a broad space for development in the future.

1.3 Contribution

The main contributions of this paper are as follows: (1) Combined with statistical data, this paper analyzes the development of structured deposits in recent years, and makes a comparative analysis between large banks and small and medium-sized banks. (2) This paper takes into account the impact of the returns of the property market, stock market and bond market on structural deposits, and analyzes the reasons for the rapid development of structural deposits from an empirical point of view, while the existing literature is mostly analyzed from a theoretical point of view.

2. The Present Situation and development motivation of structured deposits

2.1 The Present Situation of Structured Deposits Development

Since the introduction of the new asset management regulations in 2018, structural deposits have been on the rise. The number of structured deposits since 2018 is shown in figure 1 below. The data for structural deposits in 2018 are from the official website of the people's Bank of China.

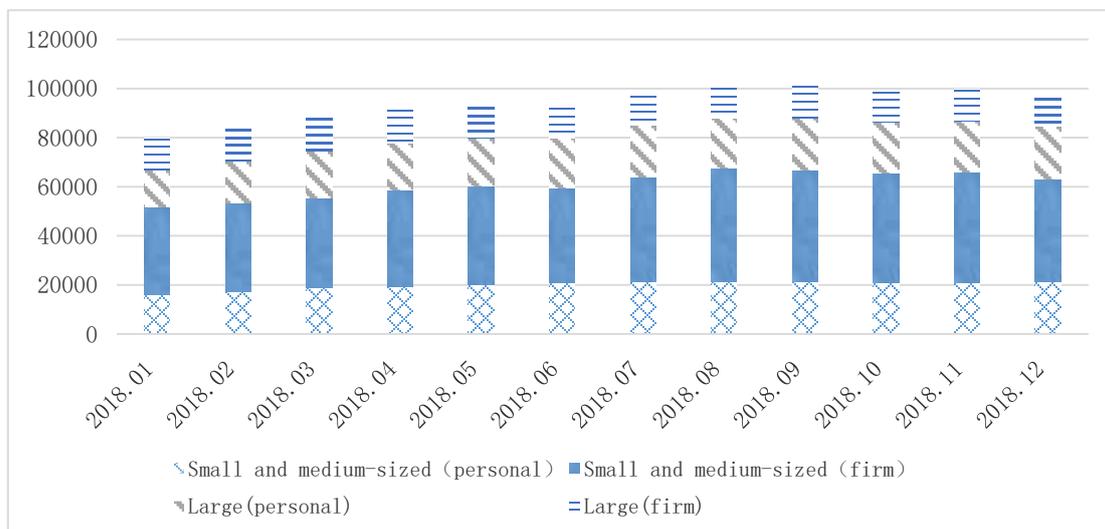


Figure 1. The Number of Structured Deposits In 2018

We can see from figure 1 that the number of structured deposits is generally increasing month by month. Since January 2018, the number of structured deposits in small and medium-sized Chinese banks and large banks has been increasing, of which, the highest proportion is the number of unit structured deposits in Chinese small and medium-sized banks. The proportion of individual structural deposits of Chinese small and medium-sized banks is not much different from that of large Chinese banks, and the smallest proportion is the number of unit structural deposits of large Chinese banks. The unit structured deposits of Chinese small and medium-sized banks are the main components of structured deposits.

Figure 2 is about the change on the curve of structural deposits in large Chinese banks. It can be seen from figure 2 that individual structural deposits in large banks are rising month by month, showing an obvious upward trend. Unit structural deposits in large banks firstly increase and then decline, the overall increase is not large. This paper speculates that this is because the unit structural deposit interest rate of small and medium-sized banks is higher than that of large banks, so the unit structural deposits of large banks have little change and have a downward trend.

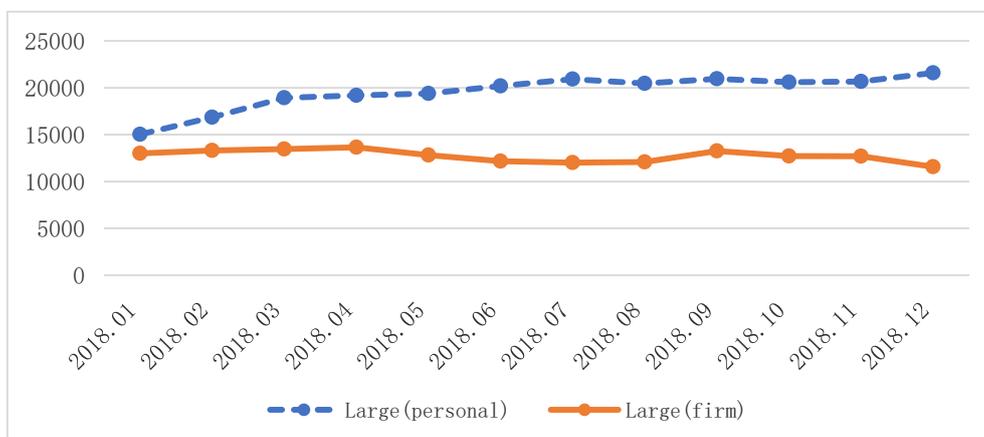


Figure 2. Structured Deposits in Large Banks

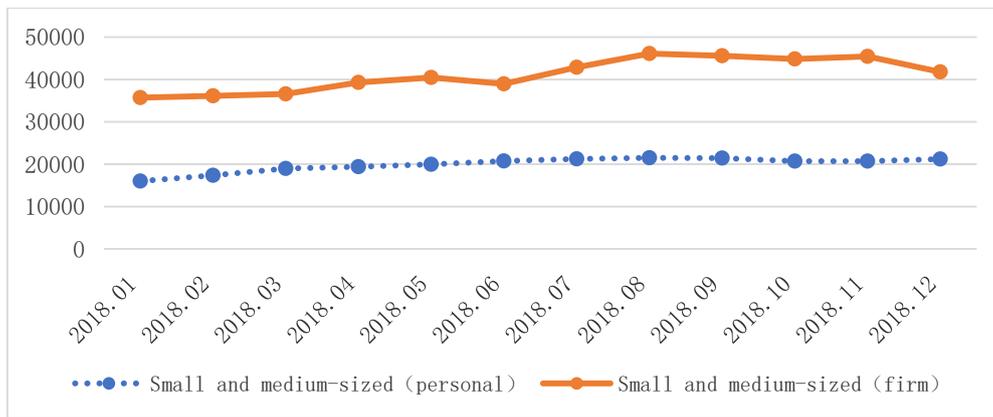


Figure 3. Structured Deposits in Small and Medium-Sized Banks

Figure 3 is about the change on the curve of structural deposits in Chinese small and medium-sized banks. As can be seen from figure 3, both unit and individual structural deposits in small and medium-sized banks show an obvious upward trend. The unit structural deposits of small and medium-sized banks increased greatly in the fluctuation, and the unit structural deposits increased greatly in 2018. The individual structural deposits of small and medium-sized banks also have an obvious upward trend, which is also closely related to the introduction of new regulations on asset management. The number of ordinates in figure 3 is significantly larger than that in figure 2, indicating that the number of structural deposits in small and medium-sized banks is significantly more than that in large Chinese banks, and the structural deposits in small and medium-sized banks account for the main part of structural deposits, which is consistent with the results of the bar chart.

2.2 Theoretical Analysis on The Development Motivation of Structured Deposits

The rapid development of structured deposits is affected by many factors. First, the yields on structured deposits have risen steadily in recent years. Customers are interest-seeking groups, and as the yields on structured deposits continue to rise, investors will increase their purchases of structured deposit products.

2.2.1 Stock Market Yield

Consumer substitution theory is also applicable to the analysis of structured deposits. When two products are homogeneous and the price of one product falls, consumers will buy more of this product. When the return on alternative assets increases, consumers' purchases of structured deposits fall, and vice versa. Stocks are used as a substitute for structured deposits. When the yield of the stock market falls, consumer demand for structured deposits will increase significantly. On the basis of this, we put forward hypothesis 1:

H1: There is a negative correlation between the demand for structured deposits and the stock market yield.

2.2.2 Bond Market Yield

The yield of the bond market is affected by many factors, including interest rate, maturity, purchase price, interest income calculated at the fixed interest rate of the bond and so on. When the bond market yield is high, the customer demand for structured deposits will decrease significantly. Bonds as a substitute for structural deposits. The lower the bond market yield, the more customer demand for structured deposits. On the basis of this, we put forward hypothesis 2:

H2: There is a negative correlation between the demand for structured deposits and the bond market yield.

2.2.3 Property Market Yield

The rate of return of the property market is also affected by many factors. Considering the impact of the rate of return of the property market on structural deposits, when the yield of the property market is high, customers will spend more assets on real estate purchase. However, the

assets owned by customers are certain, and when more assets are used for real estate purchases, consumers' demand for structured deposits will decrease. Based on this, we put forward hypothesis 3:

H3: There is a negative correlation between the demand for structured deposits and the property market yield.

2.2.4 Other influencing factors

(1) The market liquidity. One explanation for market liquidity is the ability to realize assets at a reasonable price without too much loss. On the one hand, when the market is more liquid and financial products are traded quickly, buyers of structured deposits will get higher returns. When yields rise, customers will also increase their purchases of structured deposit products. On the other hand, structured deposits can be realized within a specified period of time, and customers who buy structured deposits bear less risk, so customers' purchases of structured deposits will increase. In other words, when the market is more liquid, customers will increase their purchases of structured deposits. (2) The level of inflation. Inflation refers to a rise in prices and a decline in the purchasing power of paper money. Over a period of time, when the rate of inflation in the economy and society is higher than the interest rate of bank deposits, it will lead to the devaluation of paper money and the reduction of goods purchased by consumers. For structured deposits, a higher level of inflation will reduce the returns of structured deposits, or even negative returns. Which means, there is a negative correlation between inflation and structured deposits.

3. The Empirical Study on the Development Motivation of Structured Deposits

3.1 Model Setting

First of all, in order to test the impact of stock market yield, bond market yield, property market yield on structural deposits. Regression model is constructed as follows:

$$deposit = \alpha_1 market + \alpha_2 equity + \alpha_3 bond + \alpha_4 cpi + \alpha_5 M2 + \alpha_6 property + \varepsilon \quad (1)$$

Among them, the *deposit* represents the number of structural deposits; the *market* represents the market interest rate; the *equity* represents the stock market yield; the *bond* represents the bond market yield; the *cpi* represents the level of inflation, measured by the month-on-month growth rate; the *M2* represents market liquidity, measured by the growth rate of money issuance; the *property* represents the volatility of the property market; the ε represents the random error term.

3.2 Variable Description

3.2.1 Dependent Variable

The data on deposits are derived from the official website of the people's Bank of China, selected monthly data on structured deposits of large Chinese banks and small and medium-sized Chinese banks from January 2017 to December 2018. In order to eliminate the scale effect, the amount of structured deposits is logarithmically processed.

3.2.2 Independent Variable

(1) The *market* takes the national seven-day interbank offered rate as the proxy variable of the market-oriented interest rate, and the sample data are from the official website of the people's Bank of China. (2) The *equity* selects the return of CSI 300 index as a measurement index, and draw lessons from the practice of Haibo Zhang and Deyong Xie (2014). This paper firstly averages the daily closing price of the CSI 300 index as the monthly closing price of the CSI 300 index, and then calculates the monthly stock market return, which is recorded as R. $R = (\text{monthly closing price of this month} - \text{monthly closing price of last month}) / \text{monthly closing price of last month}$. The data comes from WIND database. (3) The *bond* is measured by the total index of Chinese bonds. Firstly, this paper averages the daily closing price of the total index of Chinese securities as the monthly closing price of the total index of Chinese bonds. Then calculate the monthly bond yield and write

it down as $R1$. $R1 = (\text{monthly closing price of this month} - \text{monthly closing price of last month}) / \text{monthly closing price of last month}$. The data come from the China debt valuation Center. (4) The $M2$ takes the growth rate of broad money issuance $M2$ as a measure, and the data comes from the people's Bank of China. (5) The cpi is measured by consumer price (CPI) month-on-month growth rate, and the data come from the National Bureau of Statistics. (6) The $property$ is measured by the average price growth rate of housing, and calculated by the average price growth rate of a hundred cities. The data comes from the WIND database.

3.2.3 Data Description

This paper selects the monthly data from January 2017 to December 2018. The structural deposits, market interest rate and $M2$ currency issuance come from the official website of the people's Bank of China; the stock market yield and property market volatility come from the WIND database, the bond market yield comes from the China Bond valuation Center, and the CPI data comes from the National Bureau of Statistics. Due to the different maturity of structured deposits launched by different banks, the yields of structured deposits are not exactly the same. The data show that the yield on structured deposits has been on an upward trend in recent years, roughly between 3.5% and 4.5%, which changes in the same direction with the number of structured deposits.

3.3 Benchmark Regression

3.3.1 Statistical Description of Variables

Table 1. Statistical Description of Variables

Variables	Observes	Mean	Std.	Min	Max
<i>deposit</i>	24	11.25	0.207	10.96	11.53
<i>market</i>	24	3.277	0.203	2.710	3.570
<i>equity</i>	24	-0.282	3.225	-5.997	5.545
<i>bond</i>	24	0.326	0.656	-1.032	1.572
<i>M2</i>	24	0.689	0.715	-0.339	2.627
<i>cpi</i>	23	0.152	0.499	-1.100	1.200
<i>property</i>	24	0.496	0.158	0.253	0.972
<i>large</i>	24	10.22	0.173	9.979	10.44
<i>small</i>	24	10.81	0.227	10.46	11.12

The statistical description of the variable is shown in Table 1 above, the average market interest rate is the largest and the average stock yield is negative, indicating that the stock market yield from 2017 to 2018 is not high and the stock market is depressed. The average yield of the bond market is 0.326%, which is higher than that of the stock market, indicating that the bond market yield is higher than the stock market yield from 2017 to 2018. Since the National Bureau of Statistics of China did not announce the month-on-month growth of CPI in December 2018, this paper finally studies the development of structural deposits for 23 months.

3.3.2 Benchmark Regression and Heterogeneity Test

First of all, this paper sums up the structural deposits of Chinese small and medium-sized banks and large Chinese banks and then carries on the overall benchmark regression to explore the motivation of the development of structured deposits. Then, the heterogeneity of the data is tested. A group test is conducted between Chinese large banks and Chinese small and medium-sized banks, and the heterogeneity test is used to study the differences in the development of structured deposits between large banks and small banks. The results are reported in Table 2.

Table 2. Benchmark regression and heterogeneity test

	Total Regression	Large Chinese Banks	Chinese Small and Medium-Sized Banks
<i>market</i>	0.0981 (0.170)	0.0516 (0.137)	0.129 (0.191)
<i>equity</i>	-0.0250** (0.0114)	-0.0229** (0.00918)	-0.0262* (0.0128)
<i>bond</i>	0.0989* (0.0553)	0.0860* (0.0447)	0.106 (0.0622)
<i>M2</i>	0.0299 (0.0463)	0.0319 (0.0374)	0.0289 (0.0520)
<i>cpi</i>	-0.0185 (0.0699)	-0.0408 (0.0565)	-0.00543 (0.0786)
<i>propert</i>	-0.573** (0.220)	-0.467** (0.177)	-0.632** (0.247)
<i>C</i>	11.16*** (0.607)	10.23*** (0.490)	10.65*** (0.682)
<i>R-squar</i>	0.659	0.682	0.644

Note: The value in () is the standard error, and the symbols ***, ** and * represent the significance level of 1%, 5% and 10% respectively.

As shown in Table 2 above, the market interest rate did not pass the significance test, indicating that there is no significant correlation between structured deposits and market interest rates. The coefficient of stock market return is negative, and the three equations pass the significance test of 5% and 10% respectively, indicating that there is a negative correlation between structural deposits and stock market returns. When the stock market yield is low, the number of structural deposits will increase, which verifies the hypothesis 1 of this paper. In other words, there is indeed a negative correlation between the demand for structured deposits and alternative assets.

In the overall regression, the coefficient of the bond market is positive, indicating that there is a positive correlation between bond market yields and structural deposits. When bond market yields are higher, the more structured deposits there will be. In the heterogeneity test, the coefficient of large banks is positive and passed the significance level test of 10%, indicating that this positive correlation is valid for large banks. The coefficient of small and medium-sized banks did not pass the significance test, indicating that this relationship is not valid in small and medium-sized banks. This is contrary to hypothesis 2 of this paper, but it can also be well explained that when yields in the bond market rise, investors get higher returns and their assets increase, so the demand for structured deposits increases. Therefore, the demand for structured deposits is positively correlated with bond market yields.

In the overall regression, the coefficient of the volatility of the property market is negative, indicating that the faster the growth of real estate prices. The higher the price, the smaller the number of structured deposits. Heterogeneity test found that the impact of this relationship is more significant in small and medium-sized banks. This result can be explained. The more real estate investment returns, the more customers will prefer real estate investment, and the demand for structured deposits will decline, which verifies hypothesis 3 of this paper. In other words, the demand for structured deposits is inversely related to the rate of return on the property market. At the same time, the results show that there is no significant correlation between structured deposits and market interest rate, market liquidity and inflation.

4. Conclusion and Discussion

This paper makes an in-depth study and analysis of the development motivation of structured deposits from both empirical and theoretical aspects. First of all, make the hypothesis from the theoretical aspect, after the empirical test, the main conclusions are as follows:

(1) Empirical study found that there is a negative correlation between structural deposits and stock market returns. The higher the stock market yield, the less customers' demand for structured deposits, which is consistent with hypothesis 1 of this paper.

(2) The study found that there is a positive correlation between structured deposits and bond market returns. This relationship is established in large banks, but not in small and medium-sized banks, indicating that the structural deposits of large Chinese banks and bond market yields are mutually reinforcing. The increase of bond market yield increases customers' total assets, and with the increase of their own assets, customers' demand for structured deposits increases.

(3) Through empirical research, it is found that there is a negative correlation between customers' demand for structured deposits and the rate of return of the property market, which is consistent with hypothesis 3 of this paper. The higher the yield in the property market, the less customer demand for structured deposits, and there is an inverse relationship between the two.

(4) There is a positive correlation between the size of structured deposits and the returns of structured deposits. The returns of structured deposits introduced by different banks are different, and the returns of structured deposits are more related to the years of the products purchased. The longer the maturity, the higher the returns, and the more the number of structured deposits will be.

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