An Effectiveness Analysis of DR as the Benchmark Interest Rate in Money Market

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Abstract: The lack of capital market product pricing standards caused by the fading out of the old international benchmark interest rates, and the need for domestic interest rate market reforms and transformation of monetary policy frameworks require our country to establish and improve its benchmark interest rate system. In the construction of the benchmark interest rate system, DR interest rate is the top priority. This paper uses the relationship and market share of the three main interest rate types DR, FDR, and SHIBOR from 2017 to 2020 to conduct an empirical study to test the feasibility of DR as the benchmark interest rate of the money market. We found that the DR interest rate can better meet the benchmark interest rate standard in terms of market and fundamentals, but it needs further discussion in terms of robustness. However, it can be said that DR interest rate has passed the benchmark interest rate test and can be used as the benchmark interest rate in our country's money market.

Keywords: Benchmark Interest Rate, DR, FDR, SHIBOR

1. Introduction

In recent years, China's macroeconomic environment has been faced with cyclical and structural changes, resulting in a new monetary policy environment and a decline in the effectiveness of the original monetary policy framework. In order to cope with this change, the timely development of monetary policy is urgently needed. China is in the transition from quantitative to price-based monetary policy framework. The transformation of monetary policy framework requires new operational objectives, intermediate objectives and new monetary policy tools. In terms of monetary policy operation objective, our country's traditional monetary policy framework of quantitative operation objective is basic currency quantity, while under the price framework is mainly dominated by interest rate regulation. So, our country's monetary policy operation target should change to the interest rate. Cultivating short-term market interest rate which can be used for monetary policy regulation is very important to our country's monetary policy framework transformation. Moreover, under the traditional quantitative monetary policy framework, bank credit occupies a dominant position in the monetary policy transmission channel of our country, and interest rate transmission channel is not perfect. The transformation of monetary policy framework requires the reform of interest rate marketization, and the regulation of interest rate becomes the main means to affect the real economy through interest rate transmission. The reform of interest rate liberalization and the cultivation of benchmark interest rate complement each other. Interest rate liberalization is to form an interest rate formation mechanism based on benchmark interest rate, mediated by money market interest rate and determined by the supply and demand of financial market. Cao further pointed out that the establishment of benchmark interest rate is the basis and premise of interest rate liberalization reform and an important link for central banks to achieve monetary policy goals [1].

On the other hand, the benchmark interest rate is of great significance as an important reference for the interest rate pricing of various financial products in the financial market. Generally speaking, the market interest rate is based on the base rate plus credit spread and term spread formation. Without an effective benchmark interest rate, it would be impossible to price financial products properly. LIBOR used to be the internationally recognized benchmark interest rate, and the deposit and loan rates of many countries are formed by adding or subtracting points on the basis of LIBOR. But since LIBOR was revealed to be rigged, its credibility in the market has been seriously weakened. Since then, LIBOR regulators have introduced a series of remedies that have not been widely accepted by the market. So, in 2017 the UK's Financial Conduct Authority (FCA) announced that it would no longer force quotation banks to report LIBOR after the end of 2021. That means LIBOR could be out of the market. In the face of the withdrawal of LIBOR, all the major developed countries have established new benchmark interest rates, but some countries have established a single benchmark interest rate, while some have multi-

benchmark coexisting mode. In August 2020, the People's Bank of China issued a white paper entitled "Participating in the Reform of International Benchmark Interest Rate and Improving China's Benchmark Interest Rate System" (hereinafter referred to as the "White Paper"), which showed China's determination to establish a sound benchmark interest rate and a market-based interest rate system. According to the white paper, the central bank will cultivate China's benchmark interest rate and market-based interest rate system with the focus on the DR Based on actual transactions. Since December 2014, the People's Bank of China has specially prepared DR, which refers to the repo weighted average interest rate formed between financial institutions of banking deposit with interest rate bonds as collateral, covering 11 varieties from overnight to one year.

What's so special about DR? First, compared with LIBOR, because LIBOR is based on quotation formation, there is no actual transaction obligation, so it is easier to be manipulated artificially; However, DR Is formed based on actual transactions, and in China's interbank market, all transactions are reached in the trading system of the trading center, with comprehensive, easy to obtain and transparent data, so it is less likely to be manipulated. Second, compared with the Shanghai interbank offered rate (SHIBOR), the pledged repo rate (R), etc., SHIBOR's market participation and overall transaction scale are not large enough, while the pledged repo rate (R) is more volatile than DR Due to the structural differences among participants at all levels in the Chinese money market. Thirdly, the white paper points out that DR Excludes the interference of the credit qualification and collateral qualification of the transaction participants, and only includes the repo transaction formed by the interest rate bond as the pledge between financial institutions of banking deposit, which is very close to the new international benchmark interest rate RFRs in nature. Moreover, DR Can best reflect the liquidity condition and financing rate of the banking system. Therefore, in the reform of interest rate liberalization, the establishment of benchmark interest rate system and the transformation of monetary policy framework, the cultivation of DR Has very important significance. Therefore, the central bank is vigorously promoting the cultivation of DR: It encourages the issuance of floating interest bonds with DR And related interest rates as reference, so as to increase the stock size of floating interest bonds in our bond market. Promote interest rate swaps with FDR as a floating reference; Actively encourage financial institutions to refer to DR For inter-bank lending, inter-bank deposit and other inter-bank business; International organizations are encouraged to use DR As the benchmark for RMB interest.

2. Review and Theoretical   Hypotheses

There has been a long history of research on benchmark interest rate, which can be mainly classified into the following three categories.

2.1. The Selection Criteria for the Benchmark Interest Rate

Clarifying the selection criteria of the benchmark interest rate is the premise of investigating the benchmark interest rate. However, in terms of the selection criteria of the benchmark interest rate, no matter from the theoretical narration or from the empirical research, the existing literature does not have a unified standard, but adopts their own standards. For example, Fang and Hua used fundamentals and robustness when verifying whether SHIBOR could be used as the benchmark interest rate [2]. Chen and Dai discussed from the aspects of accuracy and controllability [3]. Cao selects from three aspects: measurability, controllability and effectiveness [1]. Wang believed that the five most important attributes of benchmark interest rate were marketability, fundamentals, measurement and control, volatility and predictability [4]. The ideal characteristics of benchmark interest rate are foundation, representativeness, robustness, reliability, controllability, high frequency and accessibility.

Although the above summary shows that the standards proposed by the existing literatures are not the same, a careful study of the standards proposed by the above literatures shows that there are still overlapping parts in the content. For example, the effectiveness of Cao refers to the fact that the base interest rate can effectively conduct monetary policy and achieve the target of monetary policy, which has something in common with other definitions [1]. The basis of the definition of several others is that the benchmark interest rate can become the basis for the formation of other market interest rates, and is also the pricing basis of financial products. The benchmark interest rate with such nature is exactly necessary for the interest rate transmission mechanism in monetary policy, so it has some similarities. Some opinions hold that representativeness means that the formation of the benchmark interest rate requires a high degree of marketization, which can also be reflected in the scale of market transactions, the number of participants and the number of financial products formed based on the interest rate, which

is consistent with the marketability concept of Wang [5]. However, the volatility standard of Wang means that the fluctuation of interest rate is neither sensitive nor hysterical, which is also consistent with the robustness standard defined by others in terms of content [5].

Therefore, by referring to the common standards in existing literatures, this paper adopts three basic indicators, namely basic, marketability and robustness, to investigate whether DR Is suitable for the benchmark interest rate of Chinese money market.

2.2. About the Alternative Plan Suitable for Our Benchmark Interest Rate

In the white paper released by the Central Bank in August 2020, the central bank announced that the central bank would establish the base interest rate system. In the white paper, the central bank introduced the achievements of the current construction of the base interest rate system, which includes five aspects: 1. The repo rate index system based on actual transactions includes such key interest rate indicators as pledge repo rate (R), bond repo rate (DR) among deposit-based financial institutions, repo fixing rate (FR, FDR), exchange repo rate (GC) and so on. 2. The interest rates of interbank lending market include China Interbank Offered Rate (CHIBOR) and Shanghai Interbank Offered Rate (SHIBOR). 3.Yields on national bonds and policy financial bonds. 4. Interest rate swap curve. 5. Loan market quoted interest rate (LPR).

Among the existing literatures on the selection of benchmark interest rates, there are very few literatures on DR, most of which focus on SHIBOR, national debt yield and pledged repo rate R, mainly due to the short creation time of DR. This section will focus on SHIBOR. In addition, the following discussion mainly focuses on the deficiencies, which can make a clear contrast with the empirical conclusions about DR, that is, whether DR Also has those deficiencies or whether DR Has repaired those deficiencies.

Firstly, in terms of marketability, Fang and Hua pointed out that in the Chinese inter-bank trading market, both the transaction volume and the number of traders in the inter-bank lending market are far lower than those in the repo market, that is, R has stronger marketability [2]. However, Wang believed that the interbank offered rate passed the marketability test [4].

In terms of robustness, Fang and Hua indicated that SHIBOR overnight and one-month had good stability [2]. Through the data up to 2015, it was found that SHIBOR belonged to the first-order stationary sequence in the short-term (overnight, 1 week, 2 weeks, 1 month) varieties, but was non-stationary sequence in the medium and long-term four varieties.

Finally, regarding the basic aspects, Chen and Dai verified that SHIBOR as the benchmark interest rate is feasible and the interest rate transmission mechanism based on it is effective through the DSGE model constructed [3]. Fang and Hua proposed through tests that SHIBOR had high stability in the face of financial market shocks and could serve as a basis for pricing financial products [2]. However, Wang et al. found that the short-end SHIBOR plays a certain benchmark role, but it is affected by the bond repurchase rate and CHIBOR [5]. Shi and Gao also proposed that the transmission process of SHIBOR changes to the real economy is not smooth, and the interest rate transmission mechanism dominated by SHIBOR is not efficient [6]. At the same time, through empirical tests, some studies conclude that SHIBOR is better in the adaptation to the prospective Taylor rule, but the results of the stepwise regression analysis are not very ideal.

Through the above preliminary summary of the existing literature, it can be found that the empirical conclusions on the marketability, robustness and fundamentals of SHIBOR are not the same. However, after the launch of SHIBOR and the money market mutually benign promotion, the guidance of bond product pricing continues to strengthen, more and more SHIBOR as the benchmark of financial innovation products trading active, bills and repurchase market business have initially established a SHIBOR as the benchmark market pricing mechanism. Therefore, although the conclusions of the benchmark ability test of SHIBOR in the existing literature are not very uniform, SHIBOR is still widely accepted by the market in practice. In the empirical analysis of DR, DR And SHIBOR will be compared to see whether DR Is more suitable for the benchmark interest rate of the money market than SHIBOR.

2.3. Empirical Methods on the Selection of Benchmark Interest Rate

On the empirical method of the test of the benchmark interest rate, as mentioned above, due to the empirical test of DR Is less, and the empirical test of SHIBOR more literature, so this paper on the basic DR, marketability, robustness of the test will refer to the empirical test method of SHIBOR existing

literature.

The existing literature on the test method of marketability mainly explains the marketability of SHIBOR through the market share of inter-bank lending. As for the fundamental test, different literatures adopt different methods, some of which are based on Taylor's rule and sequential regression analysis. Chen and Dai built a DSGE model with SHIBOR as the benchmark interest rate, and then tested the economic forecasting ability and economic analysis ability of the model [3]. Fang and Hua applied Granger causality test and impulse response function method [2]. Wang applied Granger causality test [4]. Finally, in the robustness test, Guo et al. uses the unit root test to see whether it is a stationary time series, and also uses the impulse response function method [7].

In view of this, the testing methods of DR In this paper are arranged as follows: 1. The marketability test of DR Is mainly based on its market share. 2. The basic test of DR Is mainly based on its correlation with the members of various benchmark interest rate systems announced in the white paper, and supplemented with Granger causality test. 3. The robustness test of DR Mainly uses impulse response function method on the basis of unit root test to investigate whether Dr Can return to stability in a short period of time in the face of shocks from other base interest rates mentioned in the white paper of the Central bank.

Specifically, the marginal contribution of this paper is reflected in the following: 1. To some extent, it can supplement the lack of DR-related tests in domestic benchmark interest rate tests, because as mentioned above, domestic empirical studies on benchmark interest rate mainly focus on SHIBOR. 2. In the previous literature, when the benchmark interest rate was tested, the reference objects were all the candidates for the benchmark interest rate speculated by scholars themselves, so the reference objects selected in some literatures were not the same as those announced in the white paper of the central bank; In this paper, SHIBOR and FDR are selected as reference objects by referring to the white paper of the Central bank, which is in line with the future trend of monetary policy.

3. Empirical Research

3.1. Sample Selection and Data Sources

Based on the achievements of our benchmark interest rate system construction made clear in the white paper issued by the central bank, this paper will choose the repo fixing rate FDR and SHIBOR to analyze with DR. Since the repo fixing rate FDR was created in May 2017 in a relatively short period, the time span of other data except the section of market analysis is from June 1, 2017 to December 31, 2020. The data source is wind database.

There are 11 varieties of DR, which are 1 day, 7-day, 14-day, 21-day, 1 month, 2-month, 3-month, 4-month, 6-month, 9-month and 1 year respectively. FDR comes in three varieties, one day, seven day and 14 days. SHIBOR is available in 8 varieties, which are overnight, 1 week, 2 weeks, 1 month, 3 months, 6 months, 9 months and 1 year.

3.2. Marketability Test

In the so-called marketability test, this paper mainly focuses on the market size or trading volume of exchanges based on DR, because the market forming the benchmark interest rate should have relatively complete and comprehensive participants and large trading volume.

The marketability test data in this paper are all the turnover of various business between Chinese banks from January 1, 2010 to December 31, 2020-all from the wind database. The first is the comparison of the transaction volume of inter-bank pledged repo transaction, inter-bank lending transaction, inter-bank bond and cash transaction volume and inter-bank buyout repo transaction volume. The second is a separate comparison between the volume of interbank repo and interbank lending transactions.

It can be found that in the two tests, in the trading volume data since January 1, 2010, the trading volume of inter-bank pledged repo has exceeded the trading volume of other several transactions, and since 2013, the trading volume of inter-bank pledged repo has shown a trend of far exceeding the other several transactions, and the gap is still widening with the passage of time. In contrast, the size gap between the interbank lending market and the pledged repo market based on SHIBOR is huge. Even on December 31, 2020, the trading volume was only about 1/6 of the pledged repo market. Therefore, it can be said that the inter-bank pledged repo market has a large scale, and the pledged repo has been the

mainstream mode of inter-bank transactions.

Therefore, it is known that the bond repurchase rate (DR) among deposit-related financial institutions has good marketability. Generally speaking, DR Has passed the test of marketability. To some extent, DR Has become a "barometer" reflecting the liquidity tightness of the banking system, which has had a profound impact on the market liquidity observation behavior and created favorable conditions for the fine pricing of money market transactions.

3.3. Test of Robustness

The so-called robustness test is to test the robustness of the benchmark interest rate itself, which is the basis for the formation of other interest rates. The benchmark interest rate itself should have little volatility and should be the market interest rate that reflects the least uncertainties in the market. This stability can be explained from two aspects: first, the change of the benchmark interest rate should be relatively stable, and then the benchmark interest rate can filter out the temporary strong disturbance in the face of market fluctuations.

In terms of benchmarking DR, the following steps will be taken: 1. First, a simple descriptive statistical analysis is carried out, and the subsequent further analysis will focus on several maturity varieties with low standard deviation in the descriptive statistical analysis. 2. Unit root test will be conducted on the maturity varieties with small standard deviations selected in the first step to lay a foundation for the Granger causality test. 3. Verify the stability of VAR model, and then construct impulse response function for final test to find out whether DR Is robust.

3.3.1. Descriptive Statistics of Various Types of Bonds Repurchase Rate (DR) Among Deposit-Related Financial Institutions

Table 1 shows the descriptive statistical data of DR Varieties with various maturity periods from June 1, 2017 to December 31, 2020. It can be seen that: first, in terms of the standard deviation representing the volatility, generally speaking, the volatility of short-term DR Varieties is lower than that of medium - and long-term DR Varieties, among which the most stable varieties are 7-day DR, followed by overnight DR Varieties. The standard deviation of 2 of the remaining 9 varieties in DR Is above 0.8 (DR014, DR1M), and the standard deviation of the rest is above 0.9. However, only the standard deviation of DR1Y is above 1, and the standard deviation of other varieties is less than 1. Second, the mean and median of DR Increase with the increase of DR Maturity, which is also in line with the economic meaning represented by various DR Maturity varieties.

Table 1: Descriptive statistical analysis of DR Varieties of different maturity

Variable	Mean	Median	Maximum	Minimum	Standard deviation	Sample
DR001	2.180	2.380	2.980	0.588	0.577	896
DR007	2.502	2.615	3.162	1.138	0.388	896
DR014	2.887	2.721	5.247	1.123	0.845	896
DR021	3.045	2.829	6.936	1.152	0.966	875
DR1M	3.066	2.885	6.255	1.244	0.865	828
DR2M	3.332	3.000	6.193	1.200	0.947	835
DR3M	3.461	3.131	5.911	1.329	0.981	681
DR4M	3.705	3.319	6.102	1.600	0.920	376
DR6M	3.829	3.570	5.700	1.650	0.955	277
DR9M	3.961	3.750	5.500	1.650	0.971	90
DR1Y	4.046	3.943	5.356	1.650	1.106	114

3.3.2. Descriptive Statistical Analysis of Varieties with the Same Duration of DR, FDR and SHIBOR

Table 2 shows the descriptive statistical comparative analysis of the same term varieties of DR, FDR and SHIBOR. Among them, the repurchase fixing rate (FDR) among deposit financial institutions was launched by the trading center on the basis of DR In 2017, and the benchmark of DR Became more prominent after the launch of FDR. In terms of standard deviation, the standard deviation of DR, FDR and SHIBOR in short-term and 3-month varieties is very close except for the 1-period varieties. Therefore, from the perspective of standard deviation alone, the volatility of DR Is similar to that of SHIBOR.

Table 2: Descriptive statistical analysis of DR, FDR and SHIBOR

Variable	Mean	Median	Maximum	Minimum	Standard deviation	Sample
DR001	2.180	2.380	2.980	0.588	0.577	896
FDR001	2.183	2.400	3.000	0.600	0.567	897
SHIBOR O/N	2.191	2.406	2.998	0.602	0.572	897
DR007	2.502	2.615	3.162	1.138	0.388	896
FDR007	2.486	2.630	3.440	1.200	0.378	897
SHIBOR1W	2.544	2.642	2.978	1.481	0.325	897
DR014	2.887	2.721	5.247	1.123	0.845	896
FDR014	2.881	2.700	6.500	1.120	0.868	897
SHIBOR2W	2.858	2.735	3.989	1.253	0.708	897
DRIM	3.066	2.885	6.255	1.244	0.865	828
SHIBOR1M	3.038	2.771	4.935	1.300	0.814	897
DR3M	3.461	3.131	5.911	1.329	0.981	681
SHIBOR3M	3.241	2.924	4.913	1.391	0.906	897

3.3.3. Unit Root Test

The unit root test is carried out on the selected variable to verify whether it is a stationary sequence, which lays a foundation for the Granger causality test in the future, because only stable data can be Granger causality test, otherwise differential processing is needed. The unit root test in this section selects the ADF test, and determines the lag order of the model with a given time series according to AIC criterion.

Table 3: Unit root test results

Variable	(C, T, K)	ADF statistics	1% threshold	5% threshold	10% threshold	Stationary
DR001	(C,0,3)	-3.297	-3.468	-2.878	-2.576	Y
DR007	(C,0,0)	-4.781	-3.439	-2.865	-2.569	Y
DR014	(C,0,4)	-5.035	-4.421	-3.260	-2.771	Y
FDR001	(C,0,2)	-4.372	-3.449	-2.870	-2.571	Y
FDR007	(C,0,0)	-4.146	-3.439	-2.865	-2.569	Y
FDR014	(C,0,4)	-5.374	-4.421	-3.260	-2.771	Y
SHIBOR O/N	(C,0,2)	-4.372	-3.449	-2.870	-2.571	Y
SHIBOR1W	(C,0,0)	-3.175	-3.439	-2.865	-2.569	Y
SHIBOR2W	(C,0,2)	-2.527	-3.449	-2.870	-2.571	N

The ADF test results of unit root are shown in Table 3. Therefore, it can be found that among the three short-term varieties of these three interest rates, except for the 2-week SHIBOR variety, all of them can meet the conclusion of stationers, belonging to the first-order stationary sequence without unit root. It showed that the breeding effect of DR Short - term varieties was remarkable. Then, the results of ADF unit root test were also stable through the first-order difference of the SHIBOR varieties for 2 weeks.

As can be seen from Table 3, the three interest rates DR007, SHIBOR1W and FDR007 of one cycle do not have unit roots at the significant level of 1%, which is a stable time series. Therefore, the next test will be based on the analysis of these three interest rates to see how DR007 responds to the shocks from SHIBOR1W and FDR007.

3.3.4. Construct Impulse Response Function for Final Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	328.8851	NA	4.64e-06	-3.767458	-3.712777	-3.745274
1	679.3762	684.7744	8.95e-08	-7.715331	-7.496606*	-7.626596
2	697.6018	34.97647	8.05e-08	-7.821987	-7.439217	-7.666699*
3	704.4396	12.88500	8.25e-08	-7.796990	-7.250176	-7.575151
4	717.8076	24.72693*	7.85e-08*	-7.847487*	-7.136629	-7.559096

Figure 1: The judgment result of lag order

The stationarity of VAR should be verified before constructing impulse response function. First, on the premise that the maximum lag order is 4, various information criteria are used to judge the optimal lag order. It is found that the lag order selected by the three criteria is 4, and the lag order selected by the other two criteria is 1 and 2. Therefore, the lag order of the VAR model is defined as 4 in this section (as shown in Figure 1).

Then, the stationarity of the VAR model is tested. It is found in this paper that the reciprocal of the roots of the AR characteristic polynomial are all in the unit circle, indicating that the VAR model meets the stationarity condition, and the impulse response function can be further constructed and the Granger causality test can be conducted.
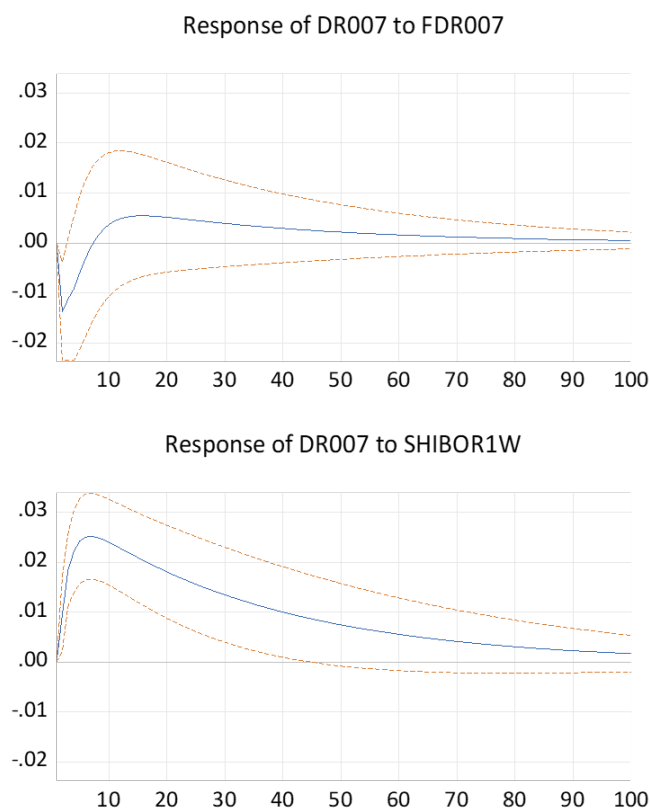

Figure 2: Impulse response result

Finally, the impulse response analysis of the established VAR model was carried out. According to the Figure 2, when facing the impact of SHIBOR1W, the DR First dropped sharply and reached the lowest point around the first stage. Then the spike peaks around the 12th issue, and finally begins to slowly return to the original state, but it does not return to the original level until around the 100th issue. In the face of the impact from FDR007, DR Showed an upward trend at the beginning and reached its peak around the 5th issue, but its recovery was slow, and even in the 100th issue, it was not close to the original level.

Therefore, in summary, it is known from various analyses that although DR Is generally stable under the standard deviation of general statistical level, in the analysis of impulse response, DR Recovers slowly in the face of the impact from the other two benchmark interest rates, with insufficient robustness.

3.4. Basic Examination

The basic test is to test whether its change will cause the change of other market interest rates. The basic test strategy is as follows: 1. The correlation between DR, SHIBOR and FDR was investigated to obtain the degree of statistical correlation of each interest rate. 2. Granger causality test is conducted to obtain Granger causality of each interest rate.

3.4.1. Correlation Analysis between DR, SHIBOR and FDR

Table 4 shows the correlation coefficients among the three varieties of DR, FDR and SHIBOR. As

can be seen from the table: First, the correlation between short-term DR Varieties was strong, and the correlation coefficient was between 0.7 and 1. May also preliminarily illustrate that short-term DR Cultivation in our country is better. Second, the correlation between the short term of DR And the short term of FDR is also strong, and the correlation coefficient is also between 0.7 and 1. Third, the correlation between the short term of SHIBOR and the short term of DR Is the strongest, and the correlation coefficient is relatively large (except for the 1 between the varieties with the same term of DR).

Table 4: Coefficient of correlation

Variable	DR001	DR007	DR014	FDR001	FDR007	FDR014	SHIBOR O/N	SHIBOR1W	SHIBOR2W
DR001	1								
DR007	0.870	1							
DR014	0.716	0.840	1						
FDR001	0.999	0.870	0.708	1					
FDR007	0.870	0.980	0.792	0.836	1				
FDR014	0.716	0.828	0.994	0.691	0.781	1			
SHIBOR O/N	0.999	0.873	0.716	1.000	0.839	0.700	1		
SHIBOR1W	0.842	0.975	0.840	0.843	0.965	0.828	0.846	1	
SHIBOR2W	0.732	0.871	0.951	0.728	0.836	0.943	0.737	0.889	1

3.4.2. Granger Causality Test among DR007, SHIBOR1W and FDR007

In the previous section, this paper has verified that the interest rates of these three varieties are stable, and the ternary VAR model established based on them is also stable. Therefore, we can carry out Granger causality test on them here, and the maximum lag order has been determined as 4 above.

In the results of Grange causality test, it can be found that SHIBOR1W and DR007 are Granger causality to each other at the significance level of 1%. However, at the significance level of 0.5%, FDR007 is not the Granger cause of DR007, but conversely, DR007 is the Granger cause of FDR007. All these show that with the development of Chinese interest rate marketization reform and construction of interest rate benchmark system, and the development and improvement of interbank market and repo market, the conductivity of DR In the money market has been strengthened with its own perfection. However, it can also be seen that although FDR is established for the purpose of perfecting and supplementing DR, in Granger causality test, its causal relationship with DR Is not as strong as that between SHIBOR and DR. This may be due to the short launch time of FDR and the low degree of improvement, so its correlation with DR Is not very strong in the above empirical tests.

4. Conclusions and Policy Recommendations

This paper mainly takes the DR, FDR and SHIBOR data from 2017 to 2020 as research samples, and mainly uses the VAR model and impulse response function to basically investigate the suitability of DR As the benchmark interest rate of our money market in three aspects, and the conclusions are mainly as follows.

First, in terms of marketability, the scale of the pledged repo market among Chinese banks is very large, and the overall scale is still expanding, that is, the DR Rate has good marketability, which can be said to have passed the marketability test.

Second, in terms of robustness, the conclusions are not completely consistent. Under the volatility level test described by standard deviation, short-term DR Varieties can be said to be in good compliance with robustness. However, when the impulse function method is used for further test, it is found that DR Has weak stability in the face of the impact from FDR and SHIBOR.

Third, the basic conclusions are consistent. There is a good correlation between DR, FDR and SHIBOR, but the correlation with FDR is not strong.

In a word, DR Performs well in the tests of marketability, robustness and fundamentals. To some extent, Dr Has been qualified as the benchmark interest rate in the money market. Although the central bank now focuses on DR To cultivate our benchmark interest rate system, there are still some defects in DR. Therefore, in order to further cultivate and develop DR As the benchmark interest rate, we can carry out our work from the following two aspects: 1. Strengthen the supervision of the inter-bank market, and further improve the term structure of DR. Although the characteristics of the pledged repo can make the DR Interest rate have a good stability, but in the face of the impact from other inter-bank transactions,

the DR Shows great volatility, so the stability of the other inter-bank interest rate is also conducive to the stability of the DR Interest rate. On the other hand, although the short-term DR Interest rate performs well in the standard deviation test part, the standard deviation of its long-end varieties is larger, so the term structure of DR Needs to be further improved. Second, policies should be further strengthened to encourage the development of FDR interest rate. Although FDR is derived on the basis of DR, the correlation between FDR and DR Is not strong when Granger causality test is conducted, which may be mainly because the market business scale based on FDR is not large and the development time is not long. Therefore, further policy support is needed to improve FDR. The improvement of FDR can in turn promote the development of DR.

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