

## “Study on the Influencing Factors of RMB Internationalization”

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#### Abstract:

At this important historical moment when global trade protectionism is spreading and China's economy is entering a new era, it is necessary to explore in depth the intrinsic determinants and influencing factors of RMB internationalization in order to solve the problems encountered in the process of RMB internationalization. In addition, it is also of great significance for Saudi Riyal to realize internationalization.

This paper will focus on the factors affecting the internationalization of RMB in combination with the current situation of China. First of all, according to the relevant theoretical analysis of the four currencies that have achieved internationalization, and summarize their development path, summarize the development experience for the internationalization of RMB. Then it studies the development process of RMB internationalization, and focuses on the impact of economic strength, financial market development, currency stability, political and military expenditure on RMB internationalization. Finally, the VAR model is established to study the long-term stable relationship among these variables and RMB internationalization, and the impulse response and variance decomposition are used to study the influence and logical relationship among different variables.

Through comprehensive analysis and demonstration, strong economic strength is a solid force for the internationalization of RMB and an important driving force for the internationalization of RMB; Military strength is an important guarantee for the internationalization of RMB; The stability of currency value is the key to realize the internationalization of RMB; Exchange rate fluctuations are not conducive to the realization of RMB internationalization to a certain extent.

**Key Words:** RMB Internationalization; Influencing Factors; VAR Model; Impulse Response; Decomposition of Varia.

#### Introduction:

##### Topic background

With the continuous improvement of China's comprehensive national strength, China's international status and comprehensive strength have been significantly improved. At the same time, RMB has also been recognized in international trade, and RMB has become an important medium in more and more international economic transactions.

The premise of the RMB internationalization is the free use of the currency. The free use of money means in theory being widely used for international transactions and extensive trading in foreign exchange markets, but in practice, it is primarily measured by indicators such as global foreign exchange reserves, international bank debt and currency stock in international debt instruments.

More than 10 years since China began trying out cross-border transaction settlement in 2009, and as early as 2016, the yuan was included in the currency basket system with special withdrawal rights. Although the international currency functions of RMB have been developed to varying degrees, so far, the function and influence of RMB as an international currency are still relatively limited, and its international use scope is still a certain distance from the US dollar and the euro. After China became the world's second largest economy in 2010, the status of the RMB in the international monetary system is not equivalent to the status of China's global economic system, although the RMB in the development of the global economic system is very big, but the RMB in the global economic and trade monetary system and important and China's economy plays an important role in the world economy in the serious mismatch.

In 2020, a sudden COVID-19 epidemic spread around the world, and the international financial markets suffered a major impact. While the RMB exchange rate continues to become more resilient, the overall trend is relatively stable. By the end of 2020, the exchange rate against a basket of currencies showed a generally stable appreciation, with the CFETS (China Foreign Exchange Exchange) index rising from 93.30 to 95.29. According to the statistics of the Bank of International Clearing Bank (BIS), after the RMB exchange rate reform in 2005, the actual effective exchange rate appreciated by 0.94% in 2018, and the nominal effective exchange rate appreciated by 1.17%, ending two consecutive years of depreciation. On the other hand, throughout 2020, the RMB exchange rate showed an "N" trend of appreciation, depreciation and appreciation, but by the end of the year, the RMB exchange rate appreciated by 6.47%. On the last trading day of 2020, the yuan reached 6.5249 against the US dollar, and the central parity rate rose 4,513 points, or 6.47%. Among them, the offshore RMB once reached 6.48945 against the US dollar, the highest level since June 2018, up 9.82% in about seven months compared to the

offshore RMB low of 7.1964 on May 27,2020. The rise is rare, while the onshore renminbi currently remains around 6.52 against the dollar.

To sum up, under the current serious impact on the global epidemic, a new opportunity and challenge for the internationalization of the RMB. Therefore, we should reasonably grasp this opportunity to promote the internationalization of the RMB. There are many factors affecting RMB internationalization, but what are the important factors? This paper will study the important factors affecting RMB internationalization and the degree of interaction between various factors, and further enhance the status of RMB in the international monetary system.

### Study Significance

Currency is a representative of a country's political, economic, cultural and other comprehensive strength. Whether a country plays the leading role in the global economic and trade, its role and position in the pattern of globalization development, as well as its existence in the development of globalization, can be reflected from the influence of currency on the global scale. In the process of a country from weak to strong, in fact, the national monetary status will also change with the change of national status. The study of RMB is of great positive significance to realize the internationalization of RMB. This paper is mainly based on the rising international status of China, and the development of RMB internationalization can not only more clearly understand the influencing factors of RMB internationalization, but also put forward reliability suggestions on the basis of research. Therefore, this paper has strong theoretical value and practical significance.

### Research ideas

This paper focuses on the influence of various factors in the internationalization of RMB. This paper first uses the theory of currency internationalization to analyze the development process of currency internationalization. Drawing on the experience of the internationalization of the four currencies, to provide a theoretical reference for the process of RMB internationalization. Based on the current situation of RMB internationalization, a functional model is established based on the analysis results, and then it analyzes the dynamic influence and long-term influence of the influencing factors and the RMB internationalization based on the empirical results. Finally, combined with the current situation of China's economic development and the empirical analysis results, the policy suggestions to promote the internationalization process of RMB are put forward.

### Analysis of the influencing factors of RMB internationalization

At present, domestic scholars mainly analyze and study the relevant contents of currency internationalization through the three major functions of currency. This paper also analyzes the three major functions of currency: value scale, trading medium and value storage, and then analyzes the influence factors of RMB internationalization under each function. The influencing factor is to influence the realization of RMB through the realization of three international internationalization.

The impact on the value scale is analyzed from the perspective of traders that only a currency with a stable exchange rate can avoid the transaction risk because of the exchange rate and interest rate risk. Therefore, the currency with a stable exchange rate is the key factor to achieve promotion.

In terms of trading media, countries with larger transaction scale will attract more traders, and the comprehensive economic strength of a country and the maturity of financial markets will affect the transaction scale. At the same time, there are many traders, but also more hope that the exchange can use the historical currency for statistics and settlement.

From the analysis of value storage, only the currency has a certain value can it have the value of reserve. The stability of a currency is the key to ensure the preservation of the currency. For the currency with poor storage stability, the risk of loss is relatively high, so it is not suitable for collection. A country's political influence, international status and military strength, will all affect the stability of the currency. At the same time, the degree of military development, political influence and financial market development will also affect the stability of monetary value, and the following will mainly discuss the impact of these factors on the internationalization of RMB.

### Strong economic strength

Research and analysis of the countries that have successfully realized currency internationalization have found that no matter which country when their currencies go towards internationalization, their own international influence is relatively large. Therefore, the internationalization of currency is also a manifestation of a country's developed comprehensive

economic strength. The same developed economic level is also an important basis for promoting the internationalization of currency.

Without strong economic and technology, it cannot support the development of currency internationalization. The level of economic development of a country plays a decisive role in the success of the journey of monetary internationalization. Because only the national economy is strong enough, can guarantee money in the face of complex international financial market, ensure not affected by impact, in the case of reducing external influence, get more sustainable vitality, ensure sustainable economic development, ensure the international market recognition of the currency, improve the role of the currency in international trade trading pricing and reserves. Similarly, when a country's economic strength is weak, its currency is very easily affected by external factors, and even its own economic system will be affected, causing changes in the currency exchange rate or value. It will also lead to lower currency users' trust in the currency, and will naturally deliberately reduce the frequency of the currency. Through the data arrangement, we can see that China is the only economy to achieve economic growth in 2020, The GDP achieved a historic breakthrough, exceeding one trillion for the first time, China's economic aggregate also reached 70% of the United States. U. S. GDP fell 3.5% in 2020, the first decline since 2009, and the worst "report card" of the US since World War II. According to data provided by relevant national departments and relevant international organizations, China's GDP accounted for 17.6% of the global total in 2020, according to 1.3% compared with previous years. If, according to the current development situation, China's total GDP will surpass the United States by 2028 and become the world's largest economy by 2028. For detailed analysis, see Figure 2.1.

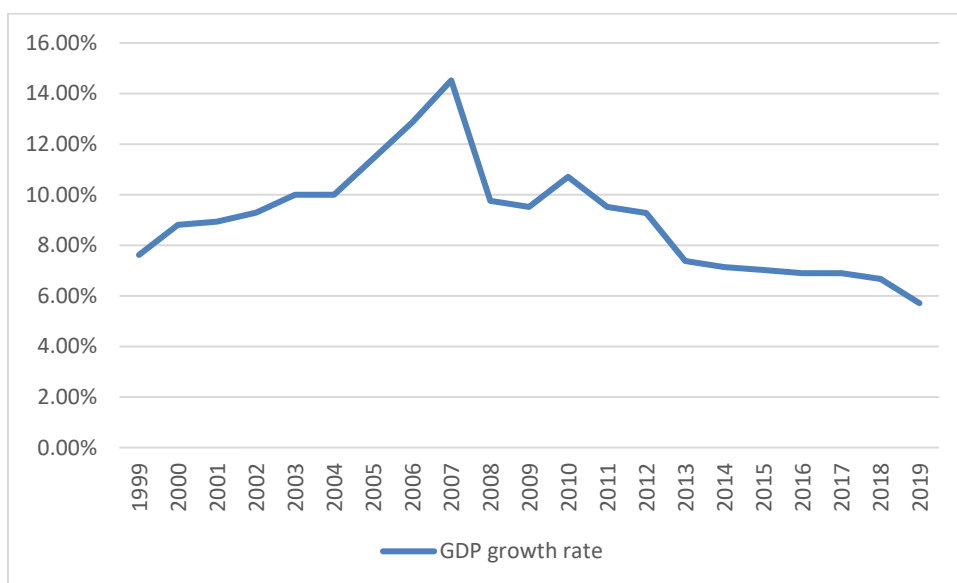


Figure 2.1 Trend map of China's GDP growth rate

Data source: National Bureau of Statistics.

### The degree of financial market development

The internationalization of currency means that a large amount of money will circulate on overseas trading markets. This also requires the financial markets of the countries where the money belongs to have the ability to provide currency circulation services for the international market. At the same time, the trading market must be highly developed and free to enter trade, to promote the global circulation of money. The trading market that can meet these characteristics generally has two characteristics. The first is the high openness. Only with the open up can it ensure the freedom of trading, not subject to some institutional or political restrictions, and the inflow and outflow of funds are relatively simple. The capital investment or blood drawing can be limited from time or space. Secondly, it must have the characteristics of high efficiency, which represents a sufficient price strain level for a variety of financial products and active secondary trading markets. Due to the high dependence on the free flowing capital market in the process of currency internationalization, a financial market with a relatively perfect degree of liberalization has a very important and positive role in promoting the internationalization of currency. At present, some economically developed countries in Europe and the United States have opened up, have relatively perfect development, and relatively mature financial system. At present, China is also trying to promote the opening up of

the financial market, and a variety of investment channels are constantly open to the outside world. The opening degree and opening depth of the financial market have been continuously deepened, and the RMB receipt to payment ratio in international capital exchanges has continued to increase.

At the end of 2019, the stock of China's bond market reached 99.000 billion yuan. Through analysis, it is actually learned in the composition and composition. The debt of foreign entities reached 2.3 trillion Yuan, China's stock market accounted for 59.3 trillion yuan, and foreign entities of China's stocks reached 2.1 trillion yuan, an increase of 82%. In 2019, the proportion of China's total stock transactions for gross national product (GDP) was 133.37 (see Figure 3.7), and the scale of share prices and bonds of foreign-owned entities increased reached 48.6%. On May 1, the daily quota of the Shanghai Stock Connect and the Shenzhen Stock Connect was expanded by four times, the daily quota was adjusted from 13 billion yuan to 52 billion yuan, and the daily quota was adjusted southward from 10.5 billion yuan to 42 billion yuan. In the same year, the collection and payment of cross-border securities investment reached 9.51 trillion yuan, with a growth rate of 49.1%, of which the net inflow reached 621.9 billion yuan.

### Stability of the currency value

The bigger a country's financial market develops, the greater the volatility of the ratio on the internationalization of its currencies. After the internationalization of its currency, it brings more capital and business to the country's market, but also brings certain financial risks, leading to fluctuations in currency values. According to the law of market changes, the liquidity of the stock market can alleviate the currency fluctuations under the financial system to a certain extent. Due to the certain differences between the internal currency value and the internationalization of the currency, it will also have a different impact on the stability of the currency value. While currency internationalization deepens, changes in international prices will also lead to exchange rate changes. When the currency is just internationalized, it can restrain the exchange rate fluctuations appropriately, but it will lead to substantial price fluctuations. Therefore, the internationalization of a country's currency should not only take into account the influence of political factors, but also promote the stability of the currency value. Promoting and implementing currency internationalization can effectively promote the development of economic globalization and reduce financial and trade risks. With the continuous implementation of monetary internationalization, it can promote the inflow of money into the countries with relatively backward economic development to a certain extent, so as to realize the balanced development of global economy. The globalization of money can not only promote the integrated development of financial development, but also improve the influence and competitiveness of the domestic financial system. An important manifestation of a country's economic prosperity and development is the stability of money and an important factor to promote the internationalization of money.

The concept of stable currency value is to say that the corresponding price index of the currency will not fluctuate too much for a period of time, and its fluctuation range is within the range of normal recognition and acceptable acceptance. Of course, while the market diversification, the price index cannot be constant. It is therefore, the stability of currency value can also reflect whether a country's economy develops steadily and prosperous. The method of stabilizing the proportion of financial market regulation is mainly through relevant monetary policy, and the regulation perspective is also divided into internal and external aspects. The effect of currency in realizing internationalization on the wallpaper stability at home and abroad is different. While currency internationalization deepens, changes in international prices will also lead to exchange rate changes. When the currency is just internationalized, it can restrain the exchange rate fluctuations appropriately, but it will lead to substantial price fluctuations.

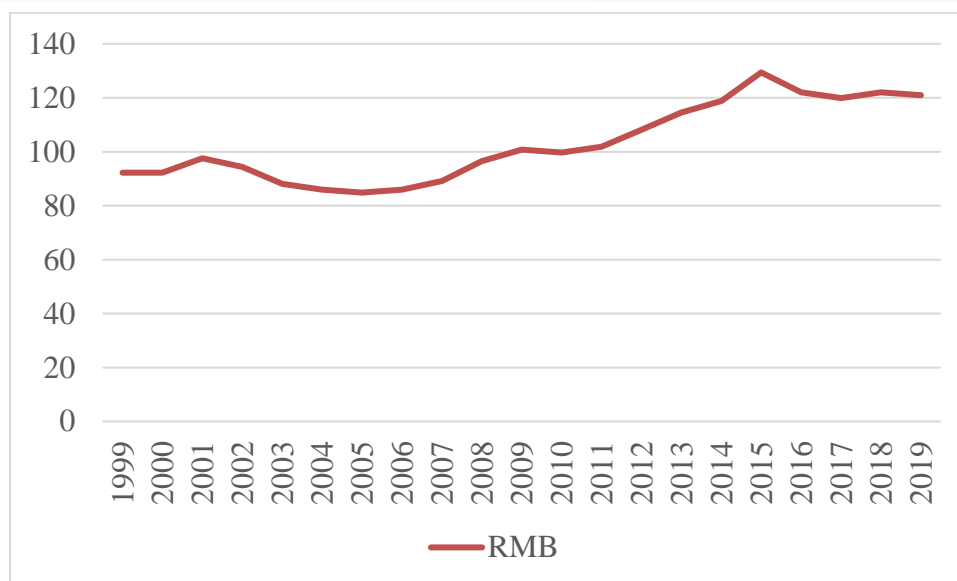


Figure 2.2 Real effective exchange rate trends of domestic RMB (1999-2019)

Data source: Bank for International Settlements.

By sorting the effective exchange rate of China since 1999 (Fig. 2.2), the exchange rate in 2010 as the reference benchmark is 100. Exchange rates showed a rising trend overall since 2001, reaching a peak in 2015. Later, under the regulation of relevant policies, the exchange rate began to gradually decline and gradually stabilize. According to international financial data, the exchange rate in a basket of currencies rises before falling. At the end of 2019, the yuan exchange rate index fell to 91.39, down 2.03% from 2018. The 2019 nominal and effective exchange rates rose 32.3% and 46.7% relative to 2005. The yuan and the dollar hit a high rate of 6.681 and a low of 7.088, with full-year volatility of 4%. There were 130 points of 113 appreciation days in 244 trading days for the year. One biggest working day gain was 0.7%, and the biggest depreciation was 0.66%. At the end of the year, the yuan traded at 6.976, down 1.62% from last year. The minimum exchange rate was 6.9662, a decrease of 1.44%. With the upgrading level of friction between China and the US trade, the RMB also showed a certain fluctuating impact on the exchange rate. In order to weaken the impact of the RMB is not to increase the exchange of other currencies just on the dollar, and to develop the corresponding exchange rules, so as to reduce the impact on the RMB exchange rate as much as possible.

### Foreign exchange reserves

A country's foreign exchange reserves refers to the part of foreign exchange in all the property of the country. It is recognized as an important part of the overall economic strength of the world. It is the key to achieving the overall balance of payments, ensuring the overall stability of the currency exchange rate and the payment of foreign debts on time. Generally speaking, a country's foreign exchange is present in the form of the currency bonds of other countries overseas, and can be exchanged into the relevant assets of the foreign currency at any time.

At present, the large major economies in global trade remain at 100 billion level. For example, the average foreign exchange savings of the G 8 reached \$356.6 billion, while the average foreign savings of the four BRICS countries reached \$1113.087 billion. Among them, only China's foreign exchange reserves have reached \$3.107.176 billion, more than the total number of the G 8 combined, as of the end of December 2020, China's foreign exchange reserves of \$3.216.5 billion after China's reform and opening up with increasing exchanges with the world, the economy has been rapid development, is also a node of foreign exchange reserves. Its foreign exchange reserve currency has the original pure US dollar, which began to diversify its reserves to a variety of currencies, such as the British pound and the franc yen. A country should have certain foreign exchange reserves for a long time and serve as an international liquidated currency. When some foreign exchange currency displays better reserves and, reproductive functions, banks should increase their holdings. When a country's currency shows a volatile value or a significant depreciation trend, it should reduce its holdings in a timely manner. It is why, the amount of a currency held by international financial institutions is also one of the manifestations of evaluating the degree of internationalization. Hali J.Edison (2002) believes that the degree of currency internationalization should be measured by



foreign exchange indicators, which mainly reflects the specific degree of internationalization in the form of proportion is as follows:

$$\text{Degree of currency internationalization} = \frac{\text{Currency official reserve balance}}{\text{Global official foreign exchange reserve balance}}$$

(Formula 2.1)

### Political and military expenditure

In the late 1940s, the United States, with its strong gold reserves and military strength, the United States made excuses to establish military bases in many countries around the world, strengthening the dominant position of the US dollar in the international monetary system through military forces.

In modern times, although some local wars around the world, such as the American Vietnam war, Afghanistan and Iraq war, because these are very unequal war, so these regional conflict did not have any impact on the development of the United States, military spending factors mainly or the Soviet Union not disintegration time of the cold war. But in recent years, friction between big countries has begun to intensify. Some regional conflicts had even gradually become proxy wars between great powers, in which countries around the world had to increase military spending to ensure the actual needs of the country's military development. According to the data, the total global military expenditure reached \$191.7 billion in 2019, of which China, the United States, Russia, India and Saudi Arabia accounted for 62% of the total spending. As China grew stronger, for the first time in 1990 at the request of the UN Secretary-General in 1990, China sent the peacekeepers to undertake regional peacekeeping missions internationally. According to a national announcement, China has 1,500 people, with a total of 10 troops performing peacekeeping missions in the peacekeeping areas designated by the United Nations. In 2019, China's military expenditure reached US \$261 billion, accounting for 14% of the total global expenditure. From 2016 to 2019, China's military expenditure accounted for about 1.9% of the total GDP.

### Empirical analysis of the influencing factors of RMB internationalization

According to the theoretical analysis mentioned above, the key factors affecting the degree of monetary internationalization mainly include economic strength, the degree of financial market development, the stability of currency value and political and military expenditure. These factors are the variables to study the impact of these factors on the internationalization of RMB. In chapter 2, the method of how to calculate the international index of the RMB is introduced. In this chapter, the CICI of RMB internationalization index will be established as the interpreted quantity. On the basis of Eviews11 measurement statistics software, the vector autoregression (VAR) model is constructed to study the relationship between RMB internationalization and economic strength, development degree of financial market, stability of currency value and political and military expenditure.

### The study hypothesis presented in this paper

According to the analysis on the factors affecting the internationalization of RMB, the research assumptions of this paper are now put forward, summarized as shown in Table 3.1.

Table 3.1 Research assumptions

Category of influencing factors	Code	Research hypothesis	Relativity
Economic strength	GDP	Economic strength is positively related to the internationalization of the RMB	+
Development degree of financial markets	S	The degree of financial market development is positively related to the internationalization of RMB	+

Currency stability value	X	Inflation rate is negatively associated with the internationalization of the RMB	-
	V	Exchange rate fluctuations are negatively related to the internationalization of the RMB	-
Political and military spending	M	Political and military expenditure is positively related to the internationalization of the RMB	+

### Variable selection and data description

The key factors affecting the degree of currency internationalization mainly include economic strength, financial market development degree, stability of currency value and political and military expenditure. Therefore, this paper, variables including the above aspects are selected to study the influence of these factors on the internationalization of RMB.

In terms of economic strength, the data of China's GDP from 1999 to 2019 was used as the index of the analysis.

In terms of financial market development, the proportion of the total GDP of securities transactions in mainland China from 1999 to 2019 was taken as a new measure. Data were obtained from the World Bank database.

In terms of currency stability, internal stability, this paper mainly selects the year-on-year growth rate of Chinese CPI from 1999 to 2019 as a measure. This index can generally feedback, and the depreciation impact caused by inflation rate and currency fluctuations. The actual effective exchange rate index from 1999 to 2019 was used as a measure, which is usually used to affect the extent of the RMB exchange rate. The former data comes from the Chinese National Bureau of Statistics, while the latter data is derived from CEIC DATA.

In terms of political and military expenditure, this paper selects the annual data of G military expenditure in 1999 to 2019 as the measurement index, which focuses on the matching degree between military strength and economic strength. Data were obtained from the World Bank database. The details are shown in Table 3.2.

Table 3.2 Variable names and data sources

Category		Variable name	Code	Data sources
Explained Variable		RMB internationalization index	CICI	Build it by myself
Explanatory variable	Economic strength	China's GDP accounts for the world	GDP	China National Bureau of Statistics
	Development degree of financial markets	Share turnover is a share of GDP	S	The World Bank database
	Development degree of financial markets	Rate of inflation	X	China National Bureau of Statistics
	Currency stability value	Exchange fluctuations	V	CEIC DATA
	Political and military forces	Military expenditure is the proportion of GDP	M	The World Bank database



### Empirical analysis of the influencing factors of RMB internationalization

Unstationary time series cause pseudo-regression that does not reflect the true relationship between variables. So before the study of the sequence, the smoothness of the sequence is one of the tasks that must be done. In general, the stationarity of the time series is judged by the unit root test of the data. At present, the two methods commonly used to test the unit root are the DF test and the ADF test, in which the DF test has formed the ADF test after continuous improvement and development. At present, the ADF test is relatively wide. Therefore, this paper also uses ADF to test the sequence stability, which the test principle is to judge whether the sequence has a unit root, no unit with is stable, with a unit root is not stable. For stationary sequences can be directly built for analysis, while for unstable need to process the sequence before modeling analysis. The stability and causality of the model are judged based on whether the sequence has this relationship, thus analyzing the relationship between the relevant variables.

### Stationarity test of variables

In order to prevent false regression, to test the stationarity of the time series, this paper adopts the unit root test, follow the general requirements of timing data analysis, the above five factors may influence the internationalization of RMB respectively unit root test, the results as shown in Table 4.3: cannot refuse the original hypothesis of "unit root", that is, there is a unit root. The D (GDP), D (S), D (V), D (CICI), D (M), and D (X) scored after the treatment were stable at the 1% level, significantly rejecting the null hypothesis of unit root. Thus, when tested, namely, CICI, GDP, S, X, V, and M are not stable sequences. D (CICI), D (X), D (S), D (M), D (V), and D (GDP) are stable sequences, indicating that the VAR model is stable and the analysis result data can be used.

Table 3.3 Unit root test results

Variable	ADF	1% Critical Value	5% Critical Value	10% Critical Value	Pvalue	Conclusion
CICI	-1.2277	-4.4983	-3.6584	-3.2689	0.8762	non-steady
GDP	-3.0407	-4.5716	-3.6908	-3.287	0.149	non-steady
S	-3.5708	-4.6162	-3.7105	-3.2978	0.0635	non-steady
X	-1.6336	-4.5715	-3.6908	-3.2869	0.7379	non-steady
V	-2.1082	-4.5325	-3.6736	-3.2773	0.5091	non-steady
M	-2.8922	-4.4983	-3.6584	-3.2689	0.1851	non-steady
D(CICI)	-4.4983	-4.5326	-3.6736	-3.2774	0.0107	steady
D(GDP)	-4.9989	-3.8574	-3.0403	-2.6606	0.0097	steady
D(S)	-3.3395	-3.9591	-3.081	-2.6813	0.0282	steady
D(X)	-4.0071	-4.5716	-3.6908	-3.2869	0	steady
D(V)	-3.2526	-3.8315	-3.0299	-2.6551	0.0324	steady
D(M)	-4.1935	-4.5716	-3.6908	-3.2869	0.0201	steady

Note: D means difference

**Co-consolidation analysis- -Johansen co-consolidation test**

The two most commonly used methods in the co-consolidation test are the E-G two-step method and the Johansen co-consolidation test. In only two variables is suitable to use E-G two-step method, in multiple variables suitable to use Johansen co-consolidation test, test does not have to divide endogenous, exogenous variables, and based on a single equation EG co-integration test must be endogenous and exogenous variables and Johansen co-integration test more stability is the basis of building the VAR model can give all co-integration relationship, and EG is not, so this paper by using Johansen co-consolidation test coordination test For the data, step 1 is to determine the lag order, while the optimal lag order is determined by the unconstrained vector auto-regression model, so the PE statistic, LR statistic, FAIC statistic and SC statistic. The results are shown in Table 3.4.

Table 3.4 Determination of lag period of vector autoregressive model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-214.2545	NA	472.486	23.1846	23.48293	23.23516
1	-121.798	116.7872	1.541442	17.24189	19.3296	17.59522
2	29.46955	95.53740*	4.17e-05*	5.108468*	8.985638*	5.764639*

Note: \* Represents the lag order chosen by the corresponding criterion

After determining the optimal lag period of the variables, the co-consolidation test is conducted here, and then, the co-consolidation relationship between the variables is judged. The test results in Table 3.5 show that at the 95% confidence level, Trace Statistic = 369,369,4925 > 95.75366, and has an accompanying probability of less than 5%, thus rejecting the null hypothesis; large when the null hypothesis is "at most one", "at most two", "at most three", "at most four", "and" at most five" at the cutoff, and the accompanying probability is all less than 5%, we accept the null hypothesis that there are at most five co-integration relations between CICI, GDP, S, X, V, and M, indicating that indicate a long-term stable equilibrium relationship between each other.

Table3.5 Johansen cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Value	Critical	Prob.**
None *	0.999988	369.4925	95.75366		0
At most 1 *	0.971608	154.4826	69.81889		0
At most 2 *	0.875225	86.81165	47.85613		0
At most 3 *	0.771388	47.26797	29.79707		0.0002
At most 4 *	0.458226	19.22911	15.49471		0.013
At most 5 *	0.329111	7.583889	3.841466		0.0059

The coconsolidation relation is as follows:

$$CICI=0.043GDP+1.9811M+0.0039S-0.0855V-0.2196X \quad (3.2)$$

The results show that the estimated coefficients of the cointegration equations meet the standard of significance test. From the long-term analysis, there is a stable relationship between the stability of the currency value, the degree of development of the financial market, the internationalization of the RMB and the economic strength and the political and

military expenditure. Among them, the enhancement of the financial market development degree, economic strength and political and military expenditure plays a positive role in promoting the internationalization of the RMB, and the exchange rate fluctuations and inflation are negatively related to it. Consistent with the study hypothesis presented in this paper.

### Stability of the VAR model

When studying the dynamic relationship of variables, the effectiveness of pulse response and variance result analysis is very critical, requires a stable VAR model, so before modeling to verify the stability of the AR root, if the best lag period in the model is K, then represents the model in total, N K characteristic root. If all features and reciprocal are less than 1, the model is proved to be a stable model, and the test results are shown in Figure 3.1.

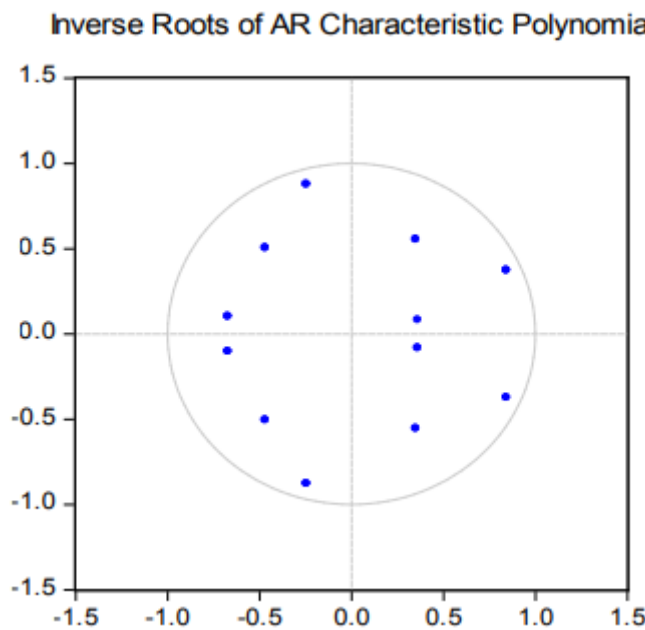


Figure 3.1 Discrimination diagram of system stability

### Dynamic analysis of the Vector auto-regression (VAR) model

The non-stationary time series are processed into related first order first integer series, and there is a variance relationship between the integer sequences, and their Granger causality and stability were tested for the results to meet the construction requirements of the VAR model. As can be seen from Table 3.4, its optimal lag period is 2, and therefore VAR (2) was selected as the model for this paper. In this model, to understand the dynamics between the variables, you need to know the relationship between the variables, but the relationship between the variables can not only be derived from the system numerical analysis of the variables, mainly because there are very complex output equations in the VAR models, and And each equation has a lot of coefficients. Therefore, instead of separately describing the equations of the VAR model in this paper, the pulse response and variance decomposition are selected to analyze the relationship between the variables. The standard deviation of a random perturbation term can make what changes and how the variable changes can be obtained by the pulse response function analysis. The main method used to analyze how the impact of one variable can change the other variables is variance decomposition.

### Pulse response function based on the VAR model

In order to analyze the dynamic characteristics of the interaction between various variables, this paper adopts the generalized pulse response function based on the error correction model (VEC) to analyze the economic strength, the development degree of financial market, currency stability, the dynamic effect of political and military expenditure to the internationalization of the RMB, and the period of impact is set to 10 periods.

(1) Analysis of the pulse response function of political and military forces (M) to RMB internationalization (CICI)

The pulse response function of political and military forces (M) to RMB Internationalization (CICI) is shown in Figure 4.2. It can be seen from the figure that an impact on the proportion of military expenditure in GDP in the current period, and positive changes in RMB internationalization will be found. It had a positive impact during the first 3 issues and reached 0.064 at issue 3, which did not change until issue 4. However, it declined from phase 4 and continued to decline until it rose steadily after phase 6. The early impact has a great impact on RMB internationalization is relatively large, in the later stage in a stable state, But the overall impact is still positive. It can be seen that the political and military forces can promote the internationalization of the RMB.

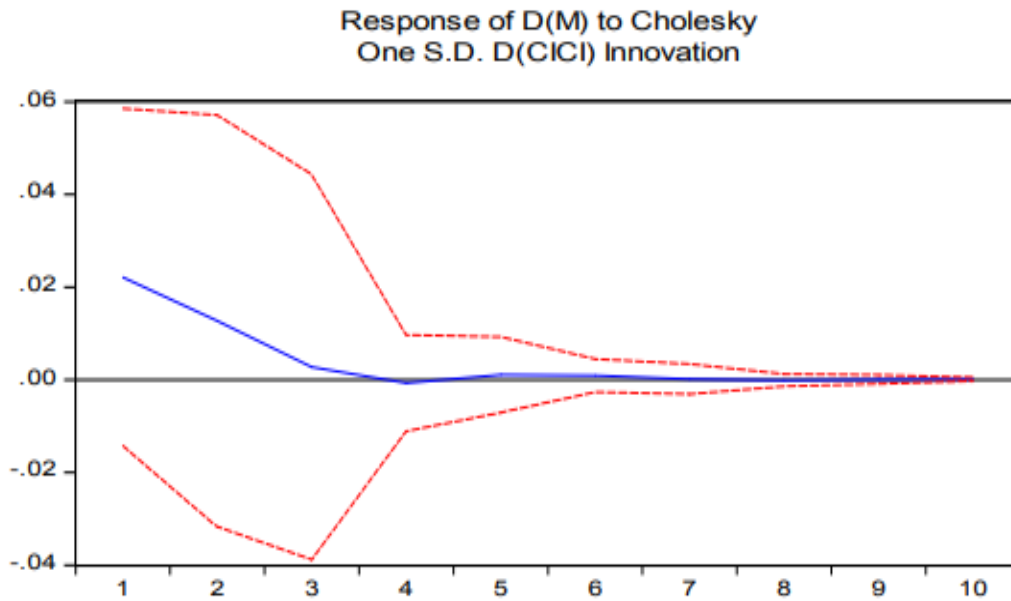


Figure 3.2 Impulse response function of M to CICI

(2) Analysis of the pulse response function of economic strength (GDP) to RMB internationalization (CICI)

Figure 3.3 is the pulse response function diagram of economic strength (GDP) to RMB Internationalization (CICI). It can be seen from the figure that it is an impact on economic strength in this period, and the RMB internationalization index will have obvious positive changes, indicating that the impact will make the internationalization of RMB develop positively. The index has been rising in the first four periods, and rose relatively large, and reached its highest value at 0.078, after which it began to decline and gradually stabilized. It can be seen that the economic strength has a great impact on the internationalization of RMB, which is the internationalization of RMB. In addition, it can also increase the cross-border settlement amount of the RMB.



Figure 3.3 The impulse response of GDP to CICI

(3) Financial market development degree (S) pulse response function analysis of RMB internationalization (CICI)

Figure 3.4 is the pulse response function diagram of the development degree of financial market development (S) to RMB internationalization (CICI). From the figure, the figure can give an impact on the development degree of the financial market. The RMB internationalization index will change positively in the first five periods, but then began to decline and has been negative. In these issues, the fourth period is at the highest value and 0.009. It can be seen that the RMB internationalization index is different from the influence of the degree of development in the financial market in the short period of time. China has formulated a series of governments to stimulate the financial market in a short term Policy, the financial market is more sensitive to these policies, like on the boAo BBS, state leaders pay very attention to the financial market, and put forward the importance of the financial structure and financial market in the future, these have a great stimulus effect on the financial market, in a short period of time also improve the cross-border settlement of the RMB; However, compared with some markets of some European and American countries, China's financial market is still relatively weak. There are still some gaps between China's financial instruments and financial market and European and American countries. Therefore, the cross-border settlement of RMB is not easy to carry out, and it is not conducive to the realization of the internationalization of RMB.

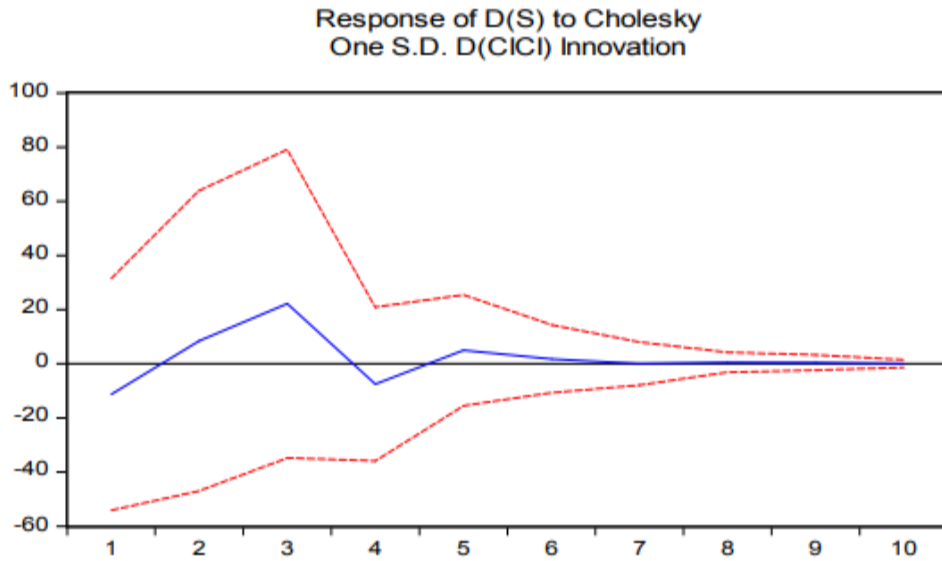


Figure 3.4 The impulse response function of S to CICI

(4) Analysis of the pulse response function of exchange rate fluctuation (V) to RMB internationalization (CICI)

The pulse response function diagram of exchange rate fluctuation (V) to RMB internationalization (CICI) is shown in Figure 3.5. We can see that the positive fluctuation performance of the exchange rate table will have a serious negative impact on the internationalization index of RMB. The same as the results on this content in international trade selection theory, the pulse function analysis shows that the impact of exchange rate fluctuations will cause negative changes in cross-border RMB settlement. Therefore, both trading sides will choose relatively stable currencies, and the purpose is to reduce risks and gain higher benefits. Because exchange rate fluctuations have a great impact on the stability of the currency value, it is not conducive to the cross-border settlement of RMB, but also not conducive to the realization of RMB internationalization.

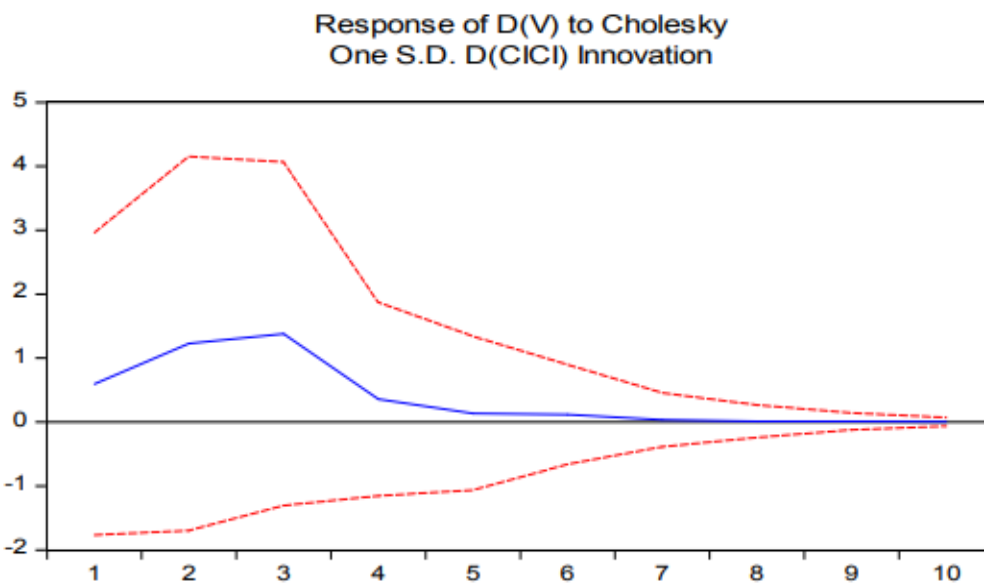


Figure 3.5 Impulse response function of V to CICI



(5) Pulse response function analysis of inflation rate (X) on RMB internationalization (CICI) through inflation rate (X) to RMB internationalization (CICI) is shown in Figure 3.6. You can see from the figure that the impact on RMB internationalization index is consistent with the findings in this paper, and the inflation rate will negatively change from the impulse response function. The CFETS index is logically an anchor for the benchmark. When the CFETS index approaches the above support level, the market can Taking this as the anchor, guide the market to find technical support for the RMB exchange rate against the US dollar, reverse the release of downward pressure on the RMB exchange rate, and stabilize market expectations.

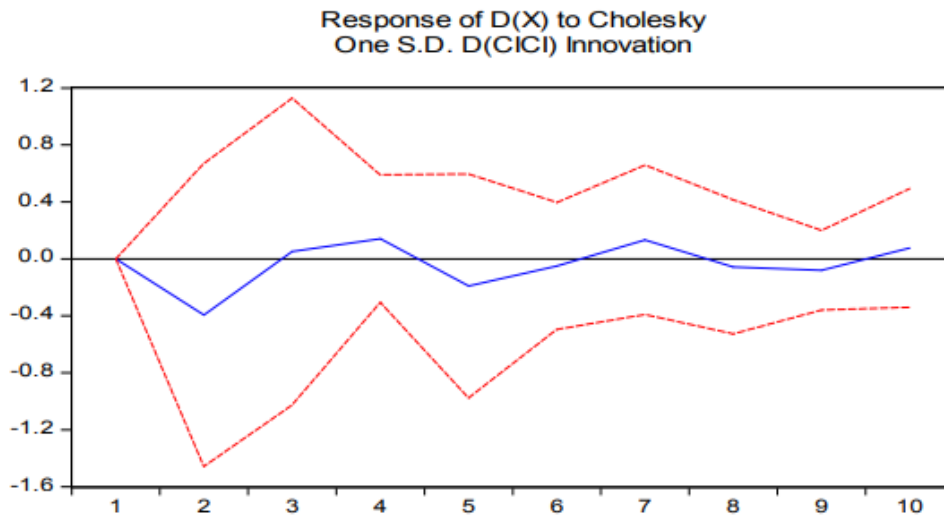


Figure 3.6 Impulse response function of X to CICI

#### Variance decomposition based on the VAR model

Because the impulse response has certain limitations, there is no way to analyze the contribution of the impact of one variable to other variables, and can only understand the impact of the impact on other variables, so this paper analyzes the contribution of the impact of each variable to the RMB internationalization index by variance, and further analyze the importance of different variables. The ANOVA results for each variable are shown in Table 3.7.

Table 3.7 shows the impact of each variable on the changes in the RMB internationalization index. It can be found in the table that at the beginning, the RMB internationalization index is not only affected by the internationalization of the RMB, but also by its own, but then it will gradually be less affected by itself, and the final impact will be reduced to 63%. In addition, in the analyzed economic strength, financial market development degree, monetary stability, and political and military expenditure, China's proportion of GDP in the world has the biggest impact on the RMB internationalization index. The greater the proportion, the greater the RMB internationalization index, and the contribution rate is 20% to the RMB internationalization index, and it is always on the rise. The growth of Chinese GDP is an important driving force of the RMB internationalization index and a solid foundation of RMB internationalization. China's share trading accounts for about 20% to GDP, and the contribution rate is relatively stable, which has a strong role in promoting the realization of the internationalization of RMB. The impact of exchange rate fluctuations on the RMB internationalization index is 3.8%, which is of great significance for maintaining the stability of the RMB currency value in the process of promoting the RMB internationalization index and accelerating the process of RMB internationalization. The inflation has less affected.

Table 3.7 Variance decomposition results

Period	S.E.	D(CICI)	D(GDP)	D(S)	D(V)	D(M)	D(X)
1	0.19601	100	0	0	0	0	0
2	0.22796	74.31481	12.49626	8.32449	2.71827	1.18763	0.95868
3	0.23614	69.73257	16.63094	8.13551	2.77522	1.34103	1.38461
4	0.24442	65.09371	19.54463	8.90428	2.81775	1.89609	1.19083
5	0.24704	63.72133	19.63662	8.75518	3.28545	2.03141	1.28545
6	0.24857	63.94985	19.68748	8.6885	3.64474	2.16798	1.64474
7	0.25043	63.35703	19.73623	8.83194	3.74137	2.13649	1.74137
8	0.25089	63.15751	19.86554	8.80388	3.77039	2.15241	1.77039
9	0.25122	63.01643	20.09723	8.91973	3.78722	2.16123	1.78722
10	0.25212	62.62076	20.10654	9.00805	3.84947	3.12761	1.84947

#### Summary

By establishing VAR model and conducting analysis, the following conclusion is that the economic strength promotes the internationalization of RMB; the political and military forces promote the internationalization of the RMB; the development of financial markets in the long term and short term, mainly through the national conditions of our country.

#### Conclusion

According to the empirical results of Chapter 3, the main factors affecting the internationalization of the RMB are China's political and military strength, economic strength, the development degree of the financial market, and the stability of the currency. This chapter studies the empirical results based on the current development situation of China.

#### Conclusion

Based on the classic theory of the determinants of the currency internationalization and the characteristics of the RMB internationalization, this paper aims to construct the RMB internationalization function model and investigate the influence of the RMB internationalization level. In order to conduct in-depth analysis, the empirical research part of this paper is the corresponding specific values of economic strength, financial market development degree, monetary stability, and political and military expenditure from 1999 to 2019. The research results are now summarized as follows.

(1) In the long term, the relationship between the economic strength, the degree of development of the financial market and the actual effective exchange rate of the RMB and the RMB internationalization index is relatively stable. Among them, the actual effective exchange rate of RMB has the biggest impact on the index. The increase of the exchange rate can develop the internationalization of RMB in the long term; and the enhanced political and military strength will also play a positive role in the internationalization of RMB.

(2) Economic strength has a strong supporting role on the internationalization of RMB. When China's economic strength has been improved, it also shows that China's international status has been improved, so China's economic strength directly affects the development of RMB internationalization. But if price prices are too high, it will adversely affect the internationalization of the yuan.

(3) The development degree of the financial market will also make the internationalization of the RMB develop positively to a certain extent. However, the current development of China's financial market is not mature, and the system is not perfect, so the development degree of the financial market has a relatively small impact on the internationalization of the RMB.

(4) Exchange rate fluctuations have a great impact on RMB internationalization, but it has a negative impact. If the exchange rate fluctuates greatly, there will be a huge exchange rate risk, so we must pay attention to the impact of the exchange rate fluctuations. The stable appreciation of the RMB exchange rate is the beginning of the internationalization of the RMB and an important boost to the further deepening of the RMB internationalization.

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#### ملخص الدراسة:

في الوقت الحاضر، مع انتشار الحمائية التجارية العالمية والاقتصاد الصيني دخول عصر جديد، من الضروري استكشاف العوامل المحددة الداخلية والعوامل المؤثرة الداخلية في تدويل اليوان من أجل حل المشاكل التي واجهتها في عملية تدويل اليوان. وبالإضافة إلى ذلك، فإنه يمكن أيضاً أن يكون إشارة هامة إلى تدويل الريال السعودي.

هذه الرسالة سوف تركز على العوامل التي تؤثر على تدويل اليوان في ضوء الوضع الحالي في الصين. أولاً، وفقاً للنظريات ذات الصلة، أربعة أنواع من العملات التي تم تدويلها تم تحليلها، ومسار التنمية من أجل تدويل اليوان تم تلخيصها. ثم دراسة عملية تدويل اليوان، والتركيز على تحليل القوة الاقتصادية، وتطوير الأسواق المالية، واستقرار العملة، النفقات العسكرية والسياسية وغيرها من العوامل الرئيسية في تدويل اليوان. وأخيراً، نموذج VAR أنشئت لدراسة العلاقة بين هذه المتغيرات على المدى الطويل الاستقرار تدويل اليوان، باستخدام الاستجابة النبضية والفرق التحلل لدراسة تأثير العلاقة بين المتغيرات المختلفة والعلاقة المنطقية.

من خلال تحليل شامل، ثبت أن قوة اقتصادية قوية هو قوة صلبة من تدويل اليوان، هو قوة دافعة هامة لتحقيق تدويل اليوان. القوة العسكرية هي ضمانة هامة تدويل اليوان. استقرار العملة هو المفتاح لتحقيق تدويل اليوان. إلى حد ما، تقلب سعر الصرف لا يفضي إلى تدويل اليوان.

**الكلمات الرئيسية:** تدويل يوان؛ تأثير عامل؛ نموذج VAR؛ الاستجابة النبضية؛ الفرق التحلل.