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Coordination Management and Competition Analysis of International Affairs Department Based on MS-VAR Model

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Abstract:

In order to effectively improve the work efficiency of the International Affairs Department, this paper proposes a coordination management and competition analysis of the International Affairs Department based on MS-VAR model. The main content of this method is based on the relevant research of MS-VAR model. This paper analyzes the impulse response function of each variable of the model, uses short-term international capital flow analysis, and finally constructs a system based on MS-VAR model through data calculation. The results showed that 33.76% of the samples were in the state of Zone 1, and the duration reached 8.8; 66.24% of the samples were in the system 2, and the duration reached 17.27. In general, the two systems had high stability. The technical method based on MS-VAR model can provide an effective and accurate way for the International Affairs Department to coordinate management and competitive analysis.

Keywords: MS-VAR model; Department of International Affairs; Coordination and management; Regional system

1. Introduction

"International affairs" is a general term for international affairs and inter state affairs, including political affairs in the traditional sense, public health, economy and trade, etc; In specific disciplines or professional fields, such as international relations, international trade, international business, international journalism and other disciplines, "international affairs" has different connotations. With the deepening of globalization, the political, economic and cultural exchanges between countries and regions are getting closer, so the international research in various professional fields is also expanding and overlapping[1]. In the past, "international affairs" usually referred to "international relations" in politics or "international management" in management, while "international affairs" in the sense of secretarial science was a relatively rare new concept. As far as the author knows, only Lihua Women's University in South Korea (hereinafter referred to as "Lihua University") has a major in international affairs transformed from secretary science. This concept of "international affairs" in the sense of secretarial science is not only related to the concepts in political science and management science, but also has its own uniqueness. There have been some articles in the academic circle introducing the international affairs major of South Korea's Pear University, comparing it with the secretarial science major in China, and calling for drawing on relevant experience to promote the transformation of secretarial science in China. However, most of these articles are only a brief introduction, lacking substantive analysis of its historical background, origin, transformation, etc., and basically use "international affairs" as a self explanatory concept, without giving a specific explanation of its significance in secretarial science. Therefore, in order to understand the connotation of the concept of "international affairs" in the field of secretarial science, we must first clarify its connotation in the fields of politics and management, and then investigate the evolution and development history of the secretarial science major of the University of Korea, and then compare it with the development of the secretarial science major in China.

"International affairs" refers to a wide range, generally referring to international relations affairs in the sense of politics, and international relations is a discipline and professional field under the category of politics [2]. "International relations are a whole of the mutual relations among countries formed on the basis of worldwide political and economic ties in the process of the internationalization of human social life, and are a general system of various social relations between international actors." In response to the deepening of globalization and the requirements of the development of the discipline itself, the research field of international

relations has expanded to a broad sense of international relations, that is, it is no longer limited to official political and diplomatic relations between countries, but also involves various political, economic and cultural issues such as non-governmental international organizations, transnational corporations, national liberation movements or terrorist activities. This is not only true for international relations, but also for diplomacy, another discipline under the political science category. Under the influence of economic globalization and multipolar development, diplomacy, which was mainly limited to the national level in the past, has been transformed into a new type of public diplomacy with more extensive social participation. More and more, it is "widely valued by all sectors of society at home and abroad, and has become a bright spot for the development of humanities and social sciences".

The trend of globalization is transnational, and the standard for measuring national strength is more focused on economic strength than traditional political and military strength [3]. This is the tendency of "trans regionalism" in international relations. The development focus of the world today is cross regional cooperation. The research field is no longer limited to the relations between countries or international and regional conflicts, but more concerned with various international affairs, such as environmental issues, business cooperation, etc. With the passage of time, the relevant trend has become more obvious. However, although the object of international relations is more diverse, the focus of attention is still mainly on international cooperation and conflict, international security and development from the perspective of political science, and relatively few studies have been conducted from the perspective of economic management. The emergence of the major of international affairs and international relations is the inevitable result of adapting to the development and changes of international social relations today. Compared with the traditional study of international relations, which focuses on political issues, military acts, terrorist organizations, etc., the study of international affairs and international relations is closer to daily life and has more room for development.

2. Literature review

The field of management also involves a large number of international affairs, mainly international management. The English translation of "management" here is "management", not "administration". It can be seen that international affairs in management refer to international operation and management. It is "management across national boundaries and cultures". Specifically, it is to understand the economy, culture, policies, laws, etc. of various

countries, master the characteristics of market demand, cultural tradition, policy requirements, laws and regulations of various countries, and cope with typical internal challenges including political factors, cultural differences, global competition, terrorism, and technological changes, so as to rationally manage transnational enterprises. To become an international manager, especially one who can effectively manage in non local areas, you need to have a variety of qualities and skills, including mastering the history, customs, cultural landscape, etc. of the host country. You must be proficient in the language of the host country, and familiar with the economic situation, trade laws, consumption habits, etc. of the host country. The formulation and implementation of international strategies and the management of global human resources are the focus of international management. In the process of formulating foreign development strategies, culture is of decisive significance for the implementation of international management. Culture involves social culture and organizational culture [4]. Social culture is often a kind of big culture, which is composed of common values, understanding, assumptions and goals, and is passed down from generation to generation. It determines how an enterprise should adapt to local differences in culture, religion, language, etc. when developing in other countries. Organizational culture is embodied as enterprise culture in an enterprise, which is determined by members' expectations, behavior norms and common goals.

For transnational enterprises, international management involves two aspects. First, multinational enterprises need the cooperation of internal personnel when dealing with various international affairs (such as changes in the international situation, fluctuations in the international market, etc.) encountered in the process of operation and operation. The formulation and implementation of enterprise strategies need internal personnel. The internal personnel of multinational enterprises not only hold different positions (such as managers, secretaries, technicians, etc.). And they come from different countries or regions and have their own cultural backgrounds, so enterprises need to use cross-cultural strategies to make good use of international talents with different cultural backgrounds. Secondly, the international cooperation of transnational enterprises is not only limited to the internal coordination of enterprises, but also involves the establishment of international strategic alliances outside enterprises. Strategic alliance "refers to the partnership formed by two or more companies, which decide to better pursue the common goal by integrating their financial, management, technology, and their existing unique competitive advantages and other resources", so as to achieve the effect of complementary advantages, mutual benefit and

win-win results. The construction of international strategic alliances by transnational enterprises naturally involves international exchanges and cooperation between enterprises from different countries. International management manages international affairs from the perspective of operation and management. The international affairs it involves are different from those in the sense of politics. The differences between the two are mainly reflected in one is "management" and the other is "relationship". The former focuses on the international management of transnational enterprises and coping with various opportunities and challenges in the international economic and financial markets, while the latter focuses on international relations, including various international affairs[5].

In response to the above problems, this paper proposes a study on coordination management and competition analysis of the International Affairs Department based on the MS-VAR model. This paper uses the MS-VAR (Markov Switching Vector Auto regions) model for empirical analysis. This model can effectively depict the dynamic transformation characteristics of various variables in different states, and has strong applicability.

3. Research Methods

3.1 Research on MS-VAR Model

3.1.1 MS-VAR model

This paper uses MS-VAR model to empirically study the spillover effects of global financial market shocks on China's exchange rate volatility and short-term cross-border capital flows. During the sample period, the state of the model regime may be "strong external shocks" and "weak external shocks" due to global risk factors and changes in US monetary policy, or "high volatility" and "low volatility" due to fluctuations in RMB exchange rate and cross-border capital flows. Therefore, this paper sets the number of model regime states s_t as 2, that is, $s_t \in \{1,2\}$. Two zone MS-VAR model design formula (1) is as follows:

$$\begin{gathered} y_t - \mu(s_t) = B_1(s_t)\left(y_{t-1} - \mu(s_{t-1})\right) + \cdots + B_p(s_t)\left(y_{t-p} - \mu\left(s_{t-p}\right)\right) + \varepsilon_t \\ y_t = \phi(s_t) + B_1(s_t)y_{t-1} + \cdots + B_p(s_t)y_{t-p} + \varepsilon_t \end{gathered} \tag{1}$$

In this paper, it is assumed that the transfer probability follows a first-order Markov chain process with discrete values. The transfer probability can be expressed by the following transfer matrix formula (2):

$$P = \begin{bmatrix} \Pr(s_{t+1} = 1 s_t = 1) \Pr(s_{t+1} = 2|_t = 1) \\ \Pr(s_{t+1} = 1 s_t = 2) \Pr(s_{t+1} = 2|s_t = 2) \end{bmatrix} = \begin{bmatrix} p_{11} & p_{21} \\ p_{12} & p_{22} \end{bmatrix} \quad (2)$$

For the measurement of external shocks in global financial markets, this paper selects the global risk factors, changes in US monetary policy (quantitative and price) and other relevant indicators; For the measurement of exchange rate fluctuation, this paper selects the middle rate of the exchange rate between the US dollar and RMB to measure [6].

MS-VAR model requires that all variables are stationary series. In this paper, Census X12 method is used to adjust the variable data seasonally, and then logarithmic difference processing is performed for each variable. Finally, ADF test method is used to test the stationarity of the above data [7]. Table 1 Unit root test results show that all variables are stationary series at the 1% significance level.

Table 1 Unit Root Test Results

variable	ADF test value	Critical value (1%, 5%, 10%)	P inspection value	Stability conclusion
VIX	-16.1583	-3.4725，-2.8799，-2.5767	0.0000	stable
USBC	-8.9989	-3.4725，-2.8799，-2.5767	0.0000	stable
USFFR	-16.2632	-3.4725，-2.8799，-2.5767	0.0000	stable
ER	-7.5014	-4.0179，-3.4389，-3.1438	0.0000	stable
SCF	-11.3672	-3.4731，-2.8802，-2.5768	0.0000	stable

In this paper, the general VAR model of each variable is constructed, and its optimal lag order P is determined to be 1; Then the specific forms of MSM (2) - VAR (1), MSI (2) - VAR (1), MSMH (2) - VAR (1), MSH (2) - VAR (1) and other models are constructed respectively; Finally, according to AIC, HQ, SC rules, log likelihood LL and LR test values, the optimal model is determined. According to the results shown in Table 2, MSMH (2) - VAR (1) model is the best choice, so this paper uses this model to analyze the spillover effects of external shocks on China's exchange rate fluctuations and short-term cross-border capital flows.

Table 2 Basis for MS-VAR Model Selection

Model structure	AIC	HQ	SC	LL	LR linearity test
MSM(2)-VAR(1)	-10.76	-10.34	-9.75	891.49	60.63
MSI(2)-VAR(1)	-10.89	-10.47	-9.87	901.27	80.20

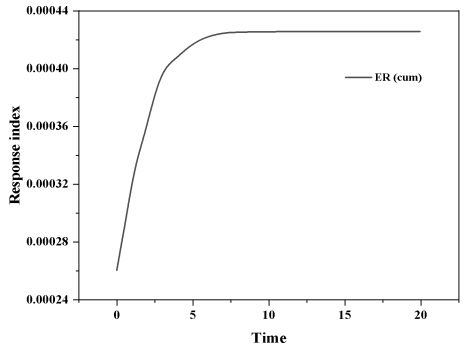
MSMH(2)-VAR(1)	-12.73*	-12.20*	-11.41*	1059.90	397.45***
MSH(2)-VAR(1)	-12.41	-11.69	-10.62	1060.44*	398.54***

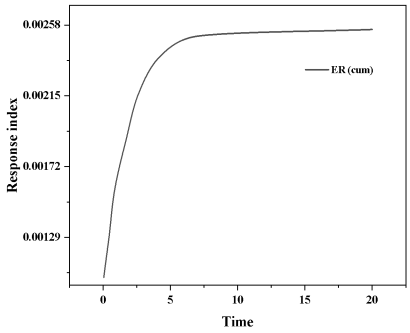
In order to effectively analyze the impact of global financial market shocks on China's RMB exchange rate volatility and short-term cross-border capital flows, this paper interprets the parameter estimation results of ER equation and SCF equation. The VIX index, a global risk factor with a lag of 1 period, has a negative impact on China's current exchange rate fluctuations, but the impact is small. It has a positive impact on China's short-term cross-border capital flows, that is, a rise of 1 unit in the VIX index with a lag of 1 period will cause 0.4438 units of short-term cross-border capital inflows in the current period; The US quantitative monetary policy (USBC) lags behind by one period and has a positive impact on the current RMB exchange rate and short-term cross-border capital outflow. The price based monetary policy (FFR) of the United States has a positive impact on the RMB exchange rate, but the impact is small. The FFR lagging behind one period will have a negative impact on China's short-term cross-border capital flows. With the increase of the federal fund interest rate, the interest margin between China and the United States has narrowed, and short-term cross-border capital will flow back to the United States from emerging market economies such as China. Parameter estimates show that a 1 unit increase in FFR lagging behind by 1 period will affect the decrease of short-term cross-border capital by 0.0312 units in the current period, thus increasing the risk of capital outflow in China; Exchange rate changes (ER) and short-term cross-border capital flows (SCF) will also interact. Short term cross-border capital inflows will cause the appreciation of the current RMB exchange rate, and depreciation of the RMB exchange rate will cause short-term cross-border capital outflows [8].

3.1.2 Impulse response function analysis of model variables

The cumulative impulse response of RMB exchange rate and short-term cross-border capital to the impact of global risk factors (VIX index). Figure 1 shows the cumulative impulse response function of the RMB exchange rate to the global risk impact. It can be seen from the figure that given the positive impact of a standard deviation of the VIX index, that is, the global risk factors increase, the convergence rate of the cumulative impulse response function of the RMB exchange rate in the two regimes is basically the same, but there are differences in the degree of response [9].

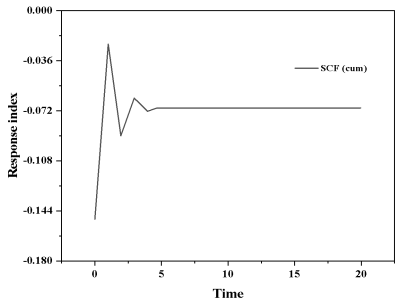
Figure 2 shows the cumulative impulse response function of short-term cross-border capital to global risk shocks. Given the positive impact of a standard deviation of the VIX index, the response function of short-term cross-border capital flows in the two zone system shows a similar convergence path, that is, first showing an upward trend and reaching the maximum in Phase 1, then falling and then rising slightly, and finally converging to a stable value around Phase 5 [10].

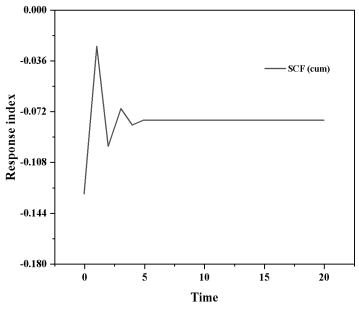




Regime 1: cum. response orth. shock to VIX (cum) Regime 2: cum. response orth. shock to VIX (cum)

Figure 1 Cumulative Impulse Response of RMB Exchange Rate to the Impact of Global Risk Factors (VIX Index)



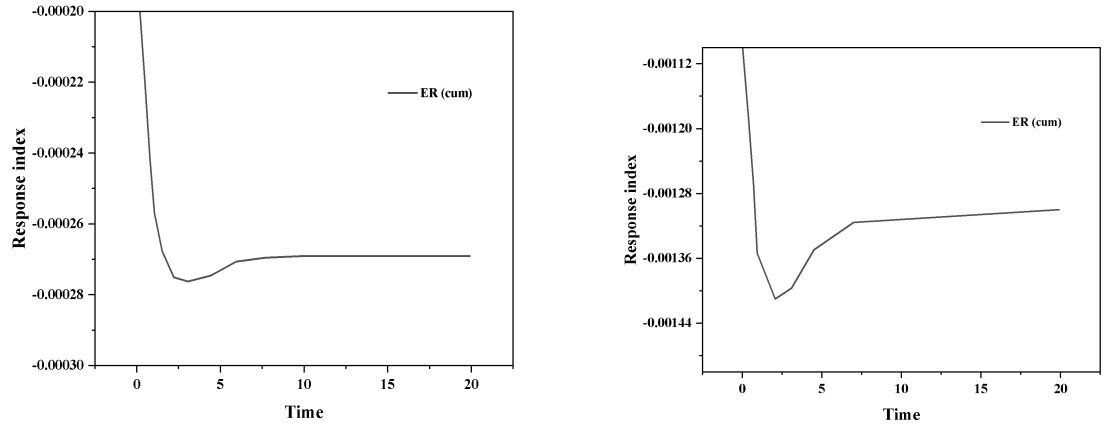


Regime 1: cum. response orth. Shock to VIX (cum) Regime 2: cum. response orth. shock to VIX (cum)

Figure 2 Cumulative Impulse Response of Short term Cross border Capital to the Impact of Global Risk Factors (VIX Index)

The cumulative impulse response of RMB exchange rate and short-term cross-border capital to the impact of quantitative monetary policy (USBC) in the United States. Figure 3 shows the cumulative impulse response function of the RMB exchange rate to the impact of the US quantitative monetary policy (USBC) [11]. In regime 1, given the positive impact of a standard deviation of USBC, the impulse response function of the RMB exchange rate shows

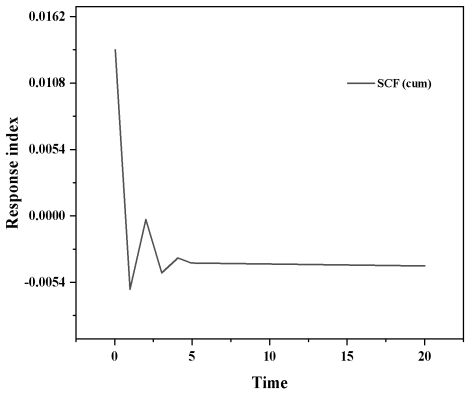
a downward trend, reaching the minimum in the third period, then slowly rising and converging to the tenth period. In regime 1, the impulse response value of the RMB exchange rate is positive. In regime 2, given the positive impact of a standard deviation of USBC, the impulse response function of the RMB exchange rate also shows a downward trend at first, reaching the minimum in the third period, then slowly rising and converging to a stable value of -0.0013 around the tenth period, and the impulse response value of the exchange rate in regime 2 is negative.

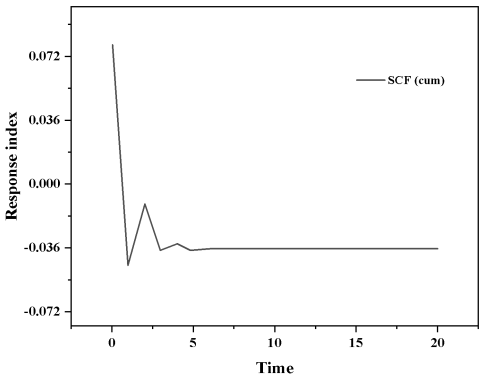


Regime 1: cum. response orth. shock to USBC (cum)Regime 2: cum. response orth. shock to USBC (cum)

Figure 3 Cumulative Impulse Response of RMB Exchange Rate to the Impact of US Quantitative Easing Monetary Policy (USBC)

Figure 4 shows the cumulative impulse response function of short-term cross-border capital to the impact of US quantitative monetary policy (USBC). Given the positive impact of a standard deviation of the USBC, the convergence path of the cumulative impulse response function of short-term cross-border capital under the two regimes is basically the same. The impulse response value under regime 2 is significantly greater than that under regime 1, indicating that the quantitative monetary policy of the United States has a greater impact on short-term cross-border capital under regime 2.





Regime 1: cum. response orth. Shock to USBC (cum)

Regime 2: cum. response orth. Shock to USBC (cum)

Figure 4 Cumulative Impulse Response of Short term Cross border Capital to US Quantitative easing Monetary Policy

3.2 Exchange rate fluctuations and short-term international capital flows

3.2.1 Analysis of short-term international capital flows

As exchange rate fluctuations, short-term international capital flows and RMB internationalization all show certain nonlinear characteristics, exchange rates have two states of appreciation and depreciation, capital inflows and outflows, and RMB internationalization has two states of acceleration and deceleration, so using the nonlinear MS-VAR model can better solve such problems. This model allows the regression parameters to vary with time depending on an unobservable regional variable [12]. The formula (3) of MS-VAR (p) model with p-order lag is as follows:

$$y_t = v(s_t) + A_1(s_t)(y_{t-1}) + \ldots + Ap(s_t)\left(y_{t-\mathrm{p}}\right) + u_t \quad (3)$$

S_t represents unobservable regime variable, and the transformation probability formula (4) from regime i to j is as follows:

$$P_{ij} = \Pr\left(s_{t+1} = j | s_t = i\right), \sum P_{ij} = 1, \forall_{i,j} \in (1,2,\ldots m) \quad (4)$$

The model uses EM algorithm to realize parameter estimation. According to whether coefficient, intercept, mean and variance change with the time-varying parameter st, different model forms can be obtained, such as MSI-VAR, MSM-VAR, MSIH-VAR, etc.

Time series are often non-stationary, so stationarity test shall be conducted before modeling [13]. This paper uses ADF unit root test method and Eviews7.2 software to test, and gets the

results in Table 3: Exchange rate volatility (ER), short-term international capital flows (CF) and RMB internationalization (RD) are all first-order single integer at the significance level of 1%.

Table 3 Unit Root Test Results

Index	ADF value	Critical value			Conclusion
		1%	5%	10%	
DER	-7.581323	-4.019561	-3.439658	-3.144229	平稳
DCF	-15.12917	-4.019561	-3.439658	-3.144229	平稳
DRD	-5.883081	-4.019561	-3.439658	-3.144229	平稳

Before establishing the VAR model, it is necessary to determine the lag order of the model. Table 4 gives the index values of different lag orders. According to the relevant criteria of the index and the principle that the minority is subordinate to the majority, the lag order of the VAR model in this paper should be level 1.

Table 4 Index Information under Different Lag Orders

Lag	0	1	2	3	4
LogL	-1956.499	-1822.818	-1817.293	-1809.568	-1799.300
LR	NA	260.1855	10.53097	14.41304	18.74409*
FPE	53136551	9967461*	10445157	10629694	10457933
AIC	26.30201	24.62843*	24.67507	24.69219	24.67517
SC	26.36249	24.87036*	25.09845	25.29701	25.46144
HQ	26.32658	24.72672*	24.84708	24.93792	24.99462

The choice of regime m is affected by the economic cycle and the actual situation of the variables. Because the exchange rate has two trends of appreciation and depreciation, short-term international capital flows have two states of inflow and outflow, and the internationalization of RMB has two situations of acceleration and deceleration. Combined with China's economic cycle rules, the regime m in this paper is determined as 2. According to different forms of MS-VAR models, GiveWin platform is used for specific selection of models [14].

As shown in Table 5, from the log likelihood value LL, MSIH (2) - VAR (1) model has the largest value. From the AIC, HQ and SC criteria, MSIH (2) - VAR (1) model has the smallest value. The LR value of the likelihood ratio linear test is 157.6683, and the P value of the chi square statistic is 0.00, that is, the original assumption of the linear model is rejected at the significance level of 1%. Therefore, the specific model of this paper is MSIH (2) - VA (2) - VAR (1).

Table 5 Indicator Information of Different Forms of Models

Model	LL	AIC	HQ	SC
MSI(2)-VAR(1)	-1876.7605	24.8335	25.0185	25.2890
MSM(2)-VAR(1)	-1856.6342	24.5704	24.7554	25.0295
MSIH(2)-VAR(1)	-1797.9137	23.8812	24.1146	24.4556
MSMH(2)-VAR(1)	-1797.9816	23.8821	24.1154	24.4565
MSIA(2)-VAR(1)	-1828.0219	24.3140	24.5715	24.9478

On the whole, the standard deviation of zone system 1 is greater than that of zone system 2, so it can be judged that zone system 1 is a state with large fluctuations in exchange rate, short-term international capital flows and RMB internationalization, and zone system 2 is a relatively stable state[15]. From a single equation, in the exchange rate equation (DER equation), short-term international capital flows and the lag period of RMB internationalization have a negative effect on exchange rate fluctuations, but this negative effect is very small; In the short-term international capital flow equation (DCF equation), the lag period 1 of exchange rate fluctuations has a positive effect on short-term international capital flows, that is, the appreciation of RMB exchange rate contributes to short-term international capital inflows, while the lag period 1 of RMB internationalization has a negative effect on short-term international capital flows, that is, promoting RMB internationalization will lead to short-term international capital outflows; In the RMB internationalization equation (DRD equation), exchange rate fluctuations and the lag of short-term international capital flows have a positive effect on RMB internationalization, that is, both the appreciation of the RMB exchange rate and the inflow of short-term international capital help promote RMB internationalization.

4. Result analysis

It can be seen from Table 6 and Table 7 that the probability of maintaining the economic system in Zone 1 is 88.64%, and the probability of converting from Zone 1 to Zone 2 is 11.36%. The probability of maintaining in Zone 2 is 94.21%, and the probability of converting from Zone 2 to Zone 1 is 5.79%. 33.76% of the samples were in Zone 1, with a duration of 8.8; 66.24% of the samples were in Zone 2, with a duration of 17.27. In a word, the two districts have high stability[16-17].

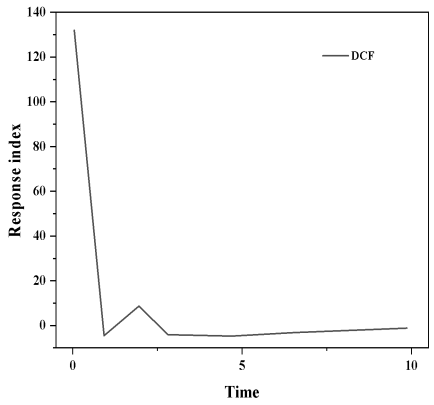
Table 6 Two zone system probability conversion

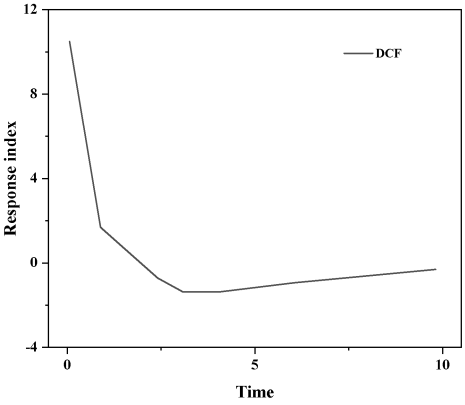
Regional system	Regional system 1	Regional system 2
Regional system 1	0.8864	0.1136
Regional system 2	0.0579	0.9421

Table 7 Two zone system attributes

Regional system	Total number of samples	Probability	Duration
Regional system 1	47.5	0.3376	8.80
Regional system 2	105.5	0.6624	17.27

Impulse response analysis can reflect the short-term dynamic relationship between variables. As shown in Figure 5, given the positive impact of one unit of exchange rate fluctuation, the responses of short-term international capital flows under the two regional systems are roughly the same, reaching the maximum and gradually declining[18]. Under district system 1, it began to rise slightly in the third month, and then gradually converged; Under Zone 2, the response of short-term international capital flows dropped to the lowest level in the fourth month, showing a negative response, and slowly converged. The response amplitude of Zone 1 is significantly greater than that of Zone 2. On the whole, when the RMB exchange rate appreciates, the main performance is capital outflow.

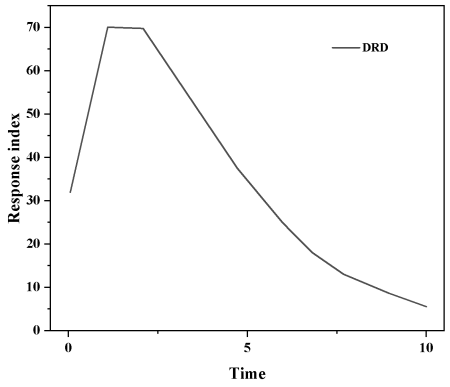


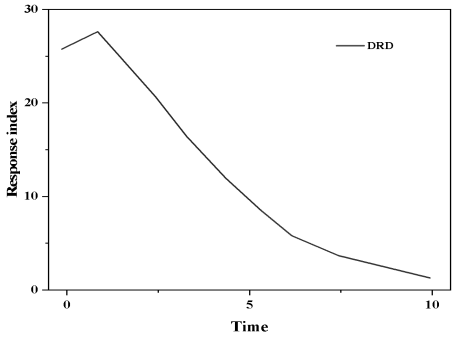


Regime 1: cum. response orth. shock to DER Regime 2: cum. response orth. shock to DER

Figure 5 Response of short-term international capital flows to exchange rate fluctuations under the two zone system

As shown in Figure 6, given the positive impact of one unit of exchange rate fluctuation, the response of RMB internationalization under the two zone system is roughly the same. The response reaches the maximum in the second month, then gradually decreases, and gradually converges in the tenth month. The response of zone 1 is greater than that of zone 2. On the whole, when the RMB exchange rate appreciates, the process of RMB internationalization accelerates, which is similar to the result of parameter estimation[19].





Regime 1: cum. response orth. shock to DER Regime 2: cum. response orth. shock to DER

Figure 6 Impact of RMB internationalization on exchange rate fluctuation under the two zone system

No matter under which regional system, the fluctuation of the RMB exchange rate has a positive effect on short-term international capital flows and RMB internationalization. That is, when the RMB exchange rate appreciates, short-term international capital flows are mainly inflow, and the process of RMB internationalization is accelerated; When the RMB exchange

rate depreciates, the short-term international capital flows are mainly manifested as outflows, and the process of RMB internationalization slows down.

The relationship between short-term international capital flows and RMB internationalization is complex. No matter under which regional system, RMB internationalization has a negative effect on short-term international capital flows. When accelerating the internationalization of RMB, short-term international capital flows are mainly manifested as outflows[20]. However, under different regional systems, short-term international capital flows have different effects on the internationalization of RMB. Under regional system 1, the inflow of short-term international capital is not conducive to the promotion of RMB internationalization. Under regional system 2, the inflow of short-term international capital is conducive to the promotion of RMB internationalization.

The RMB exchange rate, short-term international capital flows and RMB internationalization are an organic whole. To maintain China's external financial security, we must achieve a balance between the three, adhere to the direction of market-oriented exchange rate reform, strengthen the supervision of short-term international capital, orderly promote the opening of capital projects, vigorously develop the RMB offshore market, and actively and steadily promote RMB internationalization.

5. Conclusion

With the continuous development of globalization, in order to more effectively study the coordination management and competition of the Department of International Affairs, this paper proposes a method based on MS-VAR model. In recent years, with the changes in the global economic and financial environment, domestic and foreign scholars have gradually increased their research on the spillover effects of external shocks on emerging market economies. Based on the research of domestic and foreign scholars, this paper uses MS-VAR model to deeply analyze the spillover effects of global financial market shocks on China's exchange rate fluctuations and short-term cross-border capital flows under the process of financial opening. The technical method based on MS-VAR model can provide an effective and accurate way for the International Affairs Department to coordinate management and competitive analysis.

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