

Research on Cultural Identity of Marxist Chineseization Based on Extended Kalman Filter Algorithm

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ABSTRACT

The Chineseization of Marxism is one of the important topics of concern to Chinese social sciences. The study summarizes the main manifestations of the cultural identity of Marxist Chineseization, and estimates the potential growth rate of the Chinese economy using the extended Kalman filter algorithm from the dimension of material culture construction. Then based on CiteSpace, it conducts bibliometric measurements to explore the relationship between the Chineseization of Marxism and traditional Chinese culture. The measurement results of the model can better reflect the growth trend of the Chinese economy, and the economy will experience a period of medium-speed growth in the future, which should be seized to deepen the economic restructuring and promote the cultural identity of Marxist Chineseization by safeguarding the construction of material culture. The research literature on both the Chineseization of Marxism and traditional Chinese culture shows a general upward trend, especially from 2012-2021, with an increase of 3.06 times. The Chineseization of Marxism and Chinese culture have a deep-level fit, and the essence of Marxist ideology should be connected with the essence of Chinese traditional culture, so as to promote cultural identity and enhance cultural self-confidence in the process of the Chineseization of Marxism.

Keywords: extended Kalman filter algorithm, CiteSpace; bibliometrics, Marxist Chineseization, cultural identity

1. Introduction

Reviewing the development of Chinese traditional culture, before the Opium War, the traditional culture of the Chinese nation was built on the basis of agricultural civilization with Confucianism as the core and hierarchical politics and ethical outlines as the basic content, and it was recognized and supported by the people for a long period of time [1-3]. The Opium War of 1840, and the abolition of the imperial examination system in terms of Chinese culture put the literati and aspirants in the society of China at the margins, and traditional Chinese cultural identity faced a real challenge [4]. At

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the same time, from an international perspective, after the Industrial Revolution in Europe, socialized mass production led to a great increase in the strength of the European capitalist countries, the ranks of the working class continued to develop and grow, and the contradictions between the bourgeoisie and the proletariat began to rise rapidly, and it was here that Marxist thought emerged [5-6]. Around May 4, Marxism was introduced into China and was positively recognized by some advanced elements. The Chinese workers' movement also developed in practice, and gradually established the Communist Party of China (CPC). Marxism was recognized and became the guiding ideology of the Party in the process of propaganda, and after the practice and test of the Chinese revolution, the methodology and worldview of Marxism were finally recognized and accepted by the Chinese people, i.e., the process of the Chineseization of Marxism [7-10]. One of the important reasons why Marxism can be rapidly chosen, accepted, spread, believed and practiced by Chinese advanced elements, continuously enriched and developed in China, accepted by more and more Chinese people and dominated in the construction of new cultural identity is that Marxism is formally compatible with traditional Chinese thought and culture, and is able to be integrated at the spiritual level [11-14]. Marxism especially emphasizes the methodology of linking theory to practice, which subjectively makes people equate it. In the context of Chinese traditional culture facing the dilemma of modern transformation, the cultural identity of the Chinese people is in a period of confusion, while Marxism reveals the universal laws of the historical development of human society, which can exactly solve the confusion of the cultural identity of the Chinese people, so Marxism can be chosen, recognized and accepted by the Chinese people [15-18]. Studying cultural identity from the perspective of the Chineseization of Marxism can broaden the research horizons of enhancing cultural self-confidence.

In addition, the development of economic globalization, cross-cultural communication, and trade cooperation has been accompanied by the coexistence of political multipolarity and cultural pluralism, and Chinese culture has likewise seen the prosperity and complex coexistence of pluralism [19-20]. The cultural environment facing the Chineseization of Marxism is complex, with popular and elite cultures, Eastern and Western cultures, traditional and modern cultures, urban and rural cultures, all of which put forward urgent requirements for strengthening the study of Marxism and Chinese cultural identity [21-23]. Cultural identity is the belonging to or approval of the shared culture to which one belongs between people or between individuals and groups. Cultural identity is psychologically manifested as a sense of social belonging of individuals and groups to the shared culture to which they belong in terms of ideological consensus, emotional resonance, and unanimity of action, which will naturally lead to the formation and maintenance and development of this cultural identity in practice [24-25]. For a nation, cultural identity is the affirmative recognition of the most meaningful things of the nation formed by people living together in a national community for a long time, and its core is the recognition of the basic values of a nation [26-27]. Thus, cultural identity is an important foundation of national identity and state identity, and it is the deepest foundation. In today's era of economic globalization, cultural identity and value identity, which are the important foundation of national identity and state identity, have not only not lost their significance, but also become the most important "soft power" in the competition for comprehensive national power [28-29]. Therefore, it is of great theoretical and practical significance to study the Chineseization of Marxism from the perspective of cultural identity.

This paper clearly analyzes the embodiment of cultural identity in the process of the Chineseization of Marxism from three dimensions: material culture construction, institutional culture construction and spiritual culture construction. Based on the dimension of material culture construction, the extended Kalman filter algorithm is used to construct an estimation model of China's economic potential growth rate, and a single-step test of the model and a prediction of China's economic potential growth rate in the future are carried out. Subsequently, from the perspective of spiritual culture construction, with the help of visualization software CiteSpace, the

journal literature in CNKI database is mapped, and the research development trend is discussed in terms of the number of articles issued, hot content analysis, and research characteristics analysis, etc., so as to analyze the relationship between the Chineseization of Marxism and Chinese traditional culture.

2. Main manifestations of the cultural identity of the Chineseization of Marxism

The Chineseization of Marxism is a historical process, a process of accepting and identifying with Marxism, and the cultural identity embodied in the process is mainly reflected in the theoretical achievements, i.e., the two major theoretical achievements resulting from the two historic leaps in the combination of Marxism and Chinese reality. Cultural identity is mainly reflected at three levels: material culture, institutional culture and spiritual culture.

2.1. Physical culture dimension

Marx regarded capitalism as a stage of accumulation of material and productive forces before entering socialism, a transitional period for mankind to enter the next stage of history. Mao Zedong enriched and extended it in the light of China's actual situation, put forward the general line of the CPC during the transitional period, and clarified the view that capitalist transformation should be carried out in parallel with socialist development. Deng Xiaoping proposed that the essence of socialism is to liberate the productive forces and develop them, breaking through the previous assertion that socialism can only engage in a planned economy but not a market economy. As a result, China began to implement reform and opening up and established the socialist market economy system, gradually realizing leapfrog development in economic level. Later, Jiang Zemin, Hu Jintao and others contributed to the Chineseization of Marxism.

Entering the new era, Xi Jinping, from the perspective of the practice of socialism with Chinese characteristics, has closely integrated the basic principles of Marxism in focusing on the process of China's economic development, and has conducted in-depth research on it, putting forward a series of new ideas and assertions. It can be said that as the productivity of Chinese society continues to rise, people's material conditions have improved and their identification with the Chineseization of Marxism has increased, and Marxism has become more and more integrated with Chinese culture.

2.2. Institutional Culture Dimension

After the victory of China's New Democratic Revolution, China began a period of transition from a new democratic society to socialism. During the transition period, Mao Zedong clarified the nature of China's society in terms of its political system from new democracy to socialism.

Deng Xiaoping carried out a series of reforms on the basis of summarizing historical experience, inheriting and developing Marxism-Leninism and Mao Zedong Thought. First, in the political system, the people's democratic dictatorship was implemented, the system of deputies to the National People's Congress was established, the building of political parties was strengthened, and the system of regional autonomy was improved. Second, with regard to the economic system, a socialist market economy was established, following an economic system in which public ownership is the mainstay and multiple ownerships co-develop, and a distribution system in which distribution according to labor is the mainstay and multiple methods of distribution coexist.

When the international situation was complicated, Jiang Zemin always insisted on the guidance of Marxist ideology, combined with the actual situation of China at that time, and carried out system innovation and development in all aspects. Hu Jintao clearly put forward the socialist system with Chinese characteristics.

The CPC has always insisted on combining the development of Marxism with the characteristics of the times, advancing with the times and ensuring its scientific and advanced nature. This has, on the

one hand, provided an all-round guarantee for the development of the socialist system with Chinese characteristics and, on the other hand, created the political soil for the widespread acceptance of the Chineseization of Marxism.

2.3. *Spiritual and cultural dimensions*

During the New Democratic Revolution, Mao Zedong put forward the revolutionary path of “encircling cities in the countryside and seizing power through armed force”. During the transitional period, the path of socialist transformation was initiated with the “One Chemical, Three Reforms”, which ultimately led to the successful entry into the primary stage of socialism. In 1978, Deng Xiaoping put forward the policy of “emancipating the mind, seeking truth from facts, and looking forward in unity”. Jiang Zemin first put forward the important idea of “Three Represents” in 2000.

General Secretary Xi Jinping pointed out: “We must firm our historical confidence and cultural confidence, adhere to the principle of using the ancient for modern purposes and innovate while preserving the old, integrate the essence of Marxist thought with the essence of China's outstanding traditional culture, and merge it with the common values that the people use daily but are not consciously aware of. We must constantly endow scientific theories with distinctive Chinese characteristics, continually solidify the historical and mass foundation of the modernization of Marxism in China, and ensure that Marxism takes deep root in China.” This not only explains the fundamental way of the Chineseization of Marxism from the level of the combination of Marxism and Chinese traditional culture, but also reveals the logic of the identity of the Chineseization of Marxism from the perspective of the content and form of the “integration” and “fusion” of the two.

3. Estimation of the potential growth rate of the Chinese economy

The most intuitive experience of the construction of material culture for people is the changes that have taken place in Chinese society at the material level in the process of the Chineseization of Marxism. The material changes in Chinese society are mainly influenced by the level of economic development, which is inseparable from the mode of economic development and production. Nowadays, in order to ensure the identity of the material culture of Marxism in the process of the Chineseization of Marxism, it is necessary to continuously promote the change of the mode of production in China and vigorously develop the social productive forces. Whether China's economy can maintain medium-high speed growth in the future is related to whether China can promote the sustained and healthy development of the economy, therefore, this paper combines the extended Kalman filter algorithm to estimate the potential growth rate of China's economy.

3.1. *Construction of the model*

3.1.1. Extended Kalman Filter Algorithm. Kalman filtering is a linear unbiased optimal state estimation algorithm in linear systems with the criterion of minimum mean square error, and thus is widely used in many fields. However, for general nonlinear systems, it is difficult to find a rigorous recursive filtering formulation, and currently it is usually studied by approximation. Therefore, when the system is nonlinear, it is possible to linearize the system at each time step, thus transforming it into a nonlinear system that approximates a linear time-varying system, and then applying the Kalman filter to the linear time-varying system, which is the idea of the Extended Kalman Filter (EKF) for dealing with the nonlinear system. The EKF is mainly based on Taylor expansion of a nonlinear model of the system and the observation equations, retaining the first-order terms and ignoring other high order terms. The linearization is achieved by retaining the first order terms and ignoring other higher order terms. It is worth noting that although the EKF is not necessarily optimal, it works well and has become a classic and widely used method for dealing with nonlinear filtering problems.

Consider the following nonlinear system state space model:

$$X_k = f(X_{k-1}, k-1) + W_{k-1} \quad (1)$$

$$Z_k = h(X_k, k) + V_k \quad (2)$$

Where: X_k is the n -dimensional state sequence of the system, Z_k is the m -dimensional observation sequence of the system, W_k and V_k are the process noise sequence and observation noise sequence of the system, respectively, and satisfy the independent Gaussian white noise with zero mean and variance Q_k and R_k , respectively, and the initial states of W_k and V_k are independent of each other. $f(\cdot)$ is the nonlinear equation of state and $h(\cdot)$ is the nonlinear observation equation.

Expanding the nonlinear function $f(\cdot)$ of the system equations around the filtered values $\hat{X}_{k,k-1}$ into a Taylor series, retaining the first-order terms and neglecting the second-order and higher-order terms, yields:

$$X_k \approx f(\hat{X}_{k-1}, k-1) + \frac{\partial f}{\partial \hat{X}_{k-1}} (X_{k-1} - \hat{X}_{k-1}) + W_{k-1} \quad (3)$$

Order:

$$\frac{\partial f}{\partial \hat{X}_{k-1}} = \frac{\partial f(\hat{X}_{k-1}, k-1)}{\partial X_{k-1}} \bigg|_{X_{k-1} = \hat{X}_{k-1}} = F_{k,k-1} \quad (4)$$

$$f(\hat{X}_{k-1}, k-1) - \frac{\partial f}{\partial X_{k-1}} \bigg|_{X_{k-1} = \hat{X}_{k-1}} \hat{X}_{k-1} = \varphi_{k-1} \quad (5)$$

Then the equation of state is:

$$X_k = F_{k,k-1} X_{k-1} + \varphi_{k-1} \quad (6)$$

As can be seen from Eq. (6), unlike the previous basic Kalman filter equation, this equation of state adds the non-random external action term φ_{k-1} .

Similarly, the nonlinear function $h(\cdot)$ of the observation equation is expanded into a Taylor series around the filtered value $\hat{X}_{k,k-1}$, retaining the first-order terms while ignoring the second-order and higher terms, yielding:

$$Z_k = h(\hat{X}_{k,k-1}, k) + \frac{\partial h}{\partial X_k} \bigg|_{\hat{X}_{k,k-1}} (X_k - \hat{X}_{k,k-1}) + V_k \quad (7)$$

Order:

$$y_k = h(\hat{X}_{k,k-1}, k) - \frac{\partial h}{\partial X} \bigg|_{X_{k,k-1}} \hat{X}_{k,k-1} \quad (8)$$

Then the observation equation is:

$$Z_k = H_k X_k + y_k + V_k \quad (9)$$

Then combined with the standard Kalman filtering basic equation, it can be obtained that the extended Kalman filtering algorithm implementation steps are as follows.

1) Initialization:

$$\begin{aligned} \hat{X}_{0,0} &= E[X_0] \\ P_{0,0} &= E[(X_0 - \hat{X}_{0,0})(X_0 - \hat{X}_{0,0})^T] \end{aligned} \quad (10)$$

2) Temporal update (prediction): based on the given $k-1$ -moment states $\hat{X}_{k-1,k-1}$ and $P_{k-1,k-1}$, calculate the k -moment prediction mean $\hat{X}_{k,k-1}$ with variance $P_{k,k-1}$.

$$\hat{X}_{k,k-1} = f(\hat{X}_{k-1,k-1}, k-1) \quad (11)$$

$$P_{k,k-1} = F_{k,k-1} P_{k-1,k-1} F_{k,k-1}^T + Q_{k-1} \quad (12)$$

3) Observation update (correction): given a new observation, calculate the filter mean $\hat{X}_{k,k}$ and variance $P_{k,k}$:

$$K_k = P_{k,k-1} H_k^T [H_k P_{k,k-1} H_k^T + R_k]^{-1} \quad (13)$$

$$\hat{X}_{k,k} = \hat{X}_{k,k-1} + K_k (Z_k - h(\hat{X}_{k,k-1}, k)) \quad (14)$$

$$P_{k,k} = [I - K_k H_k] P_{k,k-1} \quad (15)$$

In its update rule, the EKF filtering algorithm uses only the first two orders of information mean and variance of the system equations, so the EKF algorithm has the following characteristics:

(1) Only a small amount of information, i.e., the mean and variance of the unknown distribution, needs to be saved during the calculation process. The calculation is simple and can support most of the operation process, such as searching the target area.

(2) The mean and covariance are linearly transmissible.

(3) The set of means and covariances of the system can be used to represent additional features of the distribution.

3.1.2. Measurement of the natural rate of unemployment. For the definition of the natural rate of unemployment, this paper will regard it as the level of unemployment under stable or non-accelerating inflation. For the natural rate of unemployment in China, this paper adopts the "triangular model" to measure it. The form of the model is as follows:

$$\pi_i = \alpha(L\pi)_{i-1} + \beta(L)D\gamma(LS) + u_i \quad (16)$$

Where, π_i denotes inflation, π_{i-1} denotes inflation inertia, L is the lag operator, D_i represents the demand factor that causes inflation, S_i represents the supply factor that causes inflation, and u_i is the random error term.

The definition of variables and data sources for this paper are as follows.

For the demand factor D_i , since fluctuations in aggregate demand cause the unemployment rate to deviate from the full employment level frequently, the unemployment rate is used in this paper to represent the impact of the demand factor. At present, it is very difficult to obtain data on China's unemployment rate that is in line with the international definition, so it is necessary to estimate China's true unemployment rate. The formula for estimating China's true unemployment rate is as follows:

$$\text{Surveyed urban unemployment rate} = \frac{\text{Urban unemployed population}}{\text{Urban economically active population}} \quad (17)$$

Where urban unemployed population = urban economically active population - urban employed population.

For supply-side factor S_i , China's inflation in the last decade or so has been mainly cost-driven, especially the rise in raw material prices. Combined with the availability of data, this paper chooses the growth rate of the industrial producer purchase price index-fuel and power category prices published by the National Bureau of Statistics (NBS) π_t^{energy} as the supply-side factor.

For the inflation rate, following most of the literature, this paper chooses the consumer price index

CPI, a representative indicator of inflation, to estimate the natural rate of unemployment.

3.1.3. Estimation of potential growth rate. Existing literature usually assumes that the natural rate of unemployment is constant, i.e., the natural rate of unemployment does not change over time. However, China is in a process of continuous structural change in its economy, so the natural rate of unemployment is bound to be in flux. In view of this, this paper adopts a time-varying natural rate of unemployment in order to be more in line with China's economic reality.

The literature on the natural rate of unemployment usually assumes an inflation expectation of $\pi_i^c = \pi_{i-1}$, then:

$$\pi_i - \pi_i^c = \pi_i - \pi_{i-1} = \Delta\pi_i \quad (18)$$

First, according to the theory of the natural rate of unemployment, the time series of the "unemployment rate" can be decomposed into a trend term (natural rate of unemployment) and a cyclical term (cyclical rate of unemployment), and the first measurement equation of the state-space model is as follows:

$$u_i = u_i^T + u_i^C \quad (19)$$

where u_i is the urban survey unemployment rate described above; and u_i^T represents the trend term of the unemployment rate, i.e., the natural rate of unemployment, NAIRU. u_i^C represents the cyclical term, i.e., the unemployment rate that causes inflation. The dynamics of u_i^T and u_i^C can be estimated separately based on the Kalman filter method. In addition, the second measurement equation for the state space model can be obtained from equation (16):

$$\Delta\pi_i = \alpha(I\Delta)\pi_{i-1} + \beta(L) * f(L)S_i \quad (20)$$

Where, π_i represents the inflation rate, α (L the effect of prior period inflation on current period inflation, β (L the effect of cyclical unemployment on inflation, and ε_i represents the random disturbance term.

In order to obtain the equation of state of the model, this paper assumes that the long-term trend term of the unemployment rate u^T and the cyclical term of the unemployment rate u_i^C conform to the following movement process:

$$u_i^T = u_{i-1}^T + \phi l_i + \theta_i \quad (21)$$

$$u_i^C = \rho u_{i-1}^C + \zeta_i + \theta_i \quad (22)$$

where θ_i and ζ_i represent random disturbance terms and l_i represents the annual growth rate of China's employed population. Existing literature on the natural rate of unemployment suggests that demographic changes affect the natural rate of unemployment, so this paper introduces a variable l to reflect the demographic changes in the labor market, which is what distinguishes this paper from the rest of the literature. In fact, as China's demographic structure changes, the demographic dividend gradually disappears and the new entrants to the labor market gradually decline, the natural unemployment rate may show a downward trend.

The extended Kalman filter algorithm is applied to estimate the parameters and hyperparameters of the state-space models (19) to (22), and then obtain the u_i^T (natural unemployment rate) and u_i^C (cyclical unemployment rate) separated by the Kalman filter.

3.2. Tests and measurements of the model

3.2.1. Single-step test of the model. In order to test whether the constructed model can accurately measure the future trend of China's economy, here we compare and analyze the trend and relationship between the potential growth rate and the actual growth rate measured by the model

through the single-step measurement method, and argue the reasonableness of the results of the model by taking into account the stage characteristics of China's economic development history.

Using the set model to measure the potential economic growth rate from 1995 to 2020, and comparing it with the actual economic growth rate, the comparison between the potential economic growth rate and the actual economic growth rate is shown in Figure 1. The comparison in Figure 1 reflects the characteristics of different stages of China's economic development. At the end of the 20th century, the impact of the Asian financial crisis led to a rapid decline in the actual growth rate, which was below the potential growth level. In the 21st century after the fallout of the crisis, with the warming of the external environment and the gradual emergence of the effects of proactive fiscal policy, the real growth rate has continued to lead the potential growth rate. 2008's potential growth rate against the trend is the best test of the model constructed in this paper; in order to cope with the impact of the global financial crisis, the large-scale stimulus policies to force the real growth rate to remain at a high level, much higher than the potential level, but the subsequent However, the subsequent facts also confirm the conclusions of the model, the real growth rate declined rapidly, structural problems were highlighted, the after-effects of the stimulus policies are yet to be digested, and China's economy has entered the so-called "new normal". Overall, the results of the model can well reflect the overall development trend of the Chinese economy under the changing conditions of internal and external environments, which further verifies the reliability of the model.

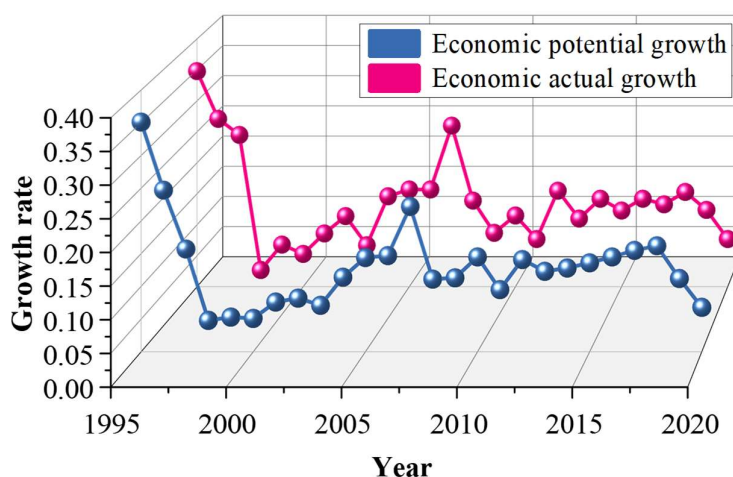


Fig. 1. The contrast between the economic potential growth rate and the actual growth rate

3.2.2. Potential growth rate measurement. The measurement of the potential growth rate of China's economy in the next five years was obtained through the measurement of the constructed model. The potential growth rate of the economy for the next 5 years is shown in Figure 2. The next 3 to 4 years will experience a medium-speed growth phase, and the potential growth rate of the overall economy will continue to decline, and the minimum may even be close to 3%. However, around 2030, after years of economic restructuring, the downward trend will usher in a rebound, and a rational structure and development model will once again drive economic development.

Overall, China's economy will experience a period of medium-speed growth in the future, which is also a window period for major reforms such as economic restructuring and industrial upgrading. Therefore, by actively adjusting the economic structure, obeying the law of the market, and using the market as the basis for resource allocation, while giving full play to the effectiveness of macroeconomic regulation and control, China's economy still has huge room for development. Marx and Engels built their economic theory system on a solid foundation based on objective economic laws. Deploying market resources according to China's economic development and accelerating the improvement of the modern market system is a development of Marxist culture in keeping with the

times, and is conducive to the cultural identity of the Chineseization of Marxism.

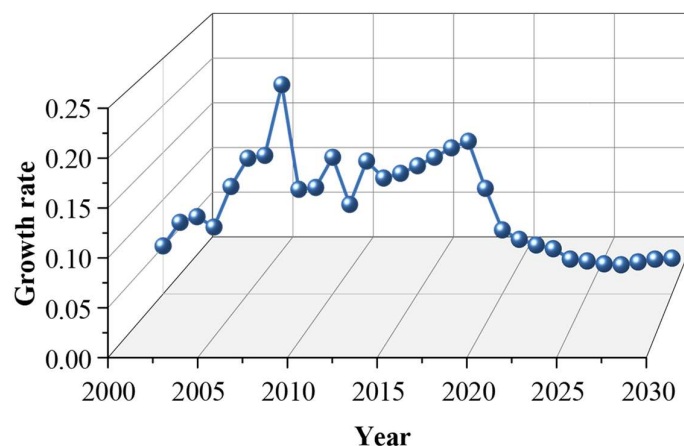


Fig. 2. The potential growth rate of the next five years

4. Relationship between the Chineseization of Marxism and traditional Chinese culture

The Chineseization of Marxism is inextricably linked to its deep-seated fit with the logic of the universal identity of Chinese traditional culture. Marxism's conception and planning of human society coincide with Chinese traditional culture. Chinese culture contains the traditions of materialism, atheism and dialectics, as well as the traditions of people-centeredness and humanitarianism, and the ideological factors of historical materialism and the social ideal of the commonwealth, so that Marxism can easily take root and bear fruits in the soil of China. Spiritual and cultural construction is the deepest need for cultural identity, and this chapter explores the relationship between the Chineseization of Marxism and traditional Chinese culture using CiteSpace software based on the bibliometric analysis in the CNKI database.

4.1. Data sources

This paper uses China National Knowledge Infrastructure (CNKI) as the database, and searches with "Sinicization of Marxism" and "traditional culture" as the keywords. The time span is set to 2000-2024, the document type is selected as "Journal", and the source category is "Peking University Core" and "CSSCI". In order to ensure the validity of the selected literature, the search results were manually screened, and irrelevant literature such as conference call for papers, results introduction, current affairs commentary, biographies, and advertisements were excluded. Export the document to reworks format and import it into CiteSpace for analysis.

4.2. Data analysis

4.2.1. Basic characterization. The annual change of the number of articles issued can relatively intuitively reflect the research heat and development trend of a certain thesis. The article counts the annual number of articles issued by CNKI journals on the relationship between the Chineseization of Marxism and traditional Chinese culture from 2000 to 2024, and the annual statistics of the overall number of articles issued by journals and the number of articles contained in journals are shown in Figs. 3 and 4. In terms of the overall number of articles issued, the number of articles issued in this research field shows a zigzag upward trend. Especially after the 18th Congress of the Communist Party of China, the academic community has set off a new round of research fusion and innovation of the basic principles of Marxism with the excellent traditional Chinese culture, and the number of

articles published has increased from 16 in 2012 to 65 in 2021, which is an increase of about 3.06 times. In terms of the number of articles carried by each journal, ideological and theoretical education, party history and party building, and social science journals are the main sources of publications in this research field. It is foreseeable that the heat of research in this field in the academia will remain at a high level in the coming period.

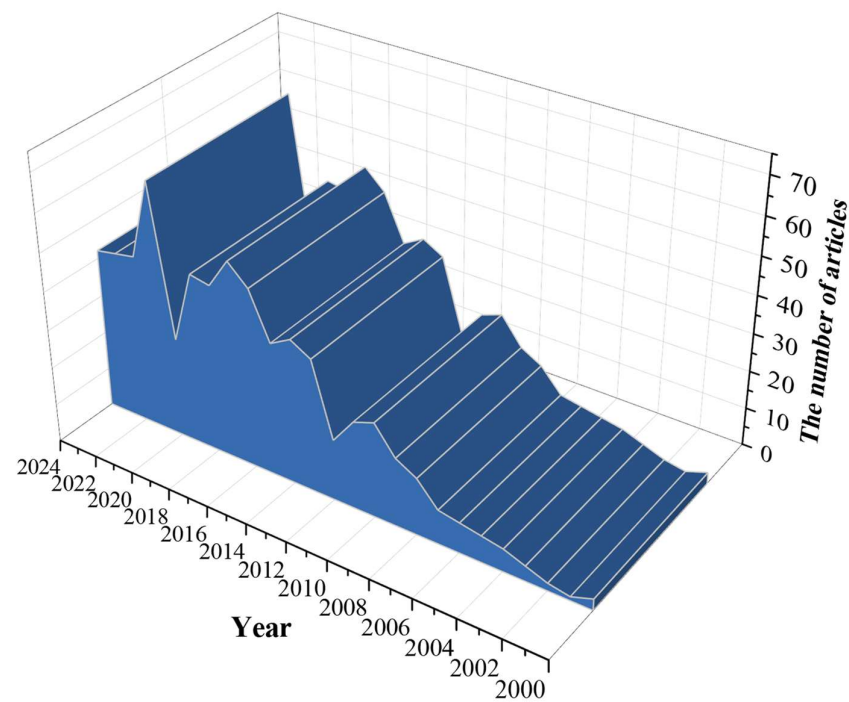


Fig. 3. Annual statistics of the general issue of the journal

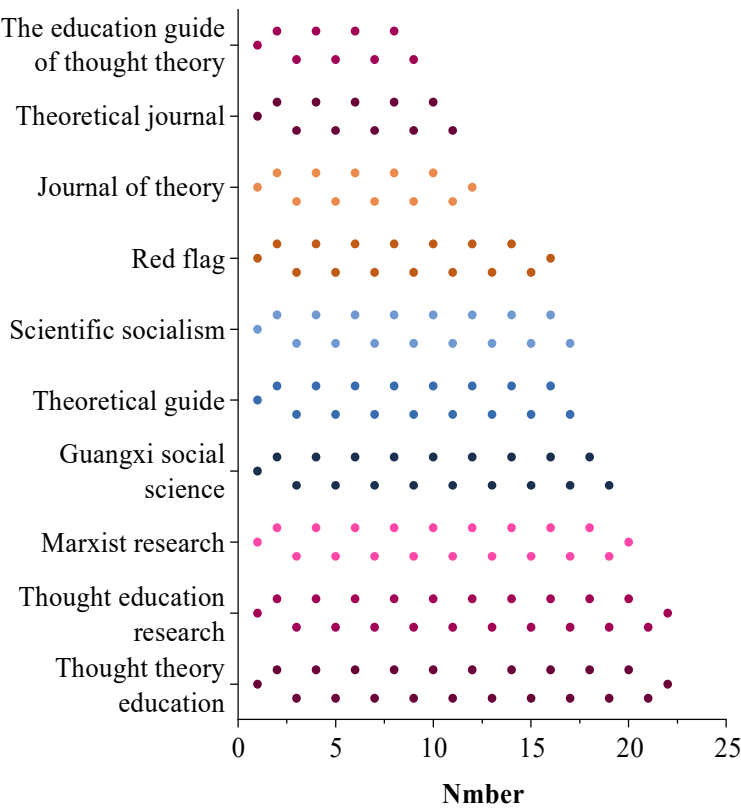


Fig. 4. Annual statistics of the amount of publication

4.2.2. Hot content analysis. In general, if the centrality of a keyword node is greater than 0.1, the keyword node centrality is greater than 0.1, and the frequency and centrality of the keyword are shown in Figure 5. Combined with the analysis of the atlas software, in addition to the search subject headings, the keywords with greater centrality on the atlas mainly include "cultural self-confidence" (0.29), "Xi Jinping" (0.24), "Confucianism" (0.17), "Mao Zedong" (0.17), "new era" (0.22), "modernization" (0.17), "integration" (0.15) and "theoretical innovation" (0.12). Among them, the frequency of "cultural identity" in the study of the sinicization of Marxism and traditional Chinese culture is also high, with a centrality of 0.07. To summarize the research on the relationship between the Sinicization of Marxism and traditional Chinese culture, this paper mainly focuses on the necessity, possibility, historical process and achievements of the combination of the two. The expression of the excellent traditional Chinese culture contains the language forms that the people like to see, which can influence the expression of Marxism, and it is necessary to use the discourse system of traditional culture to realize the localized development of Marx and promote the cultural identity of Marxism in China.

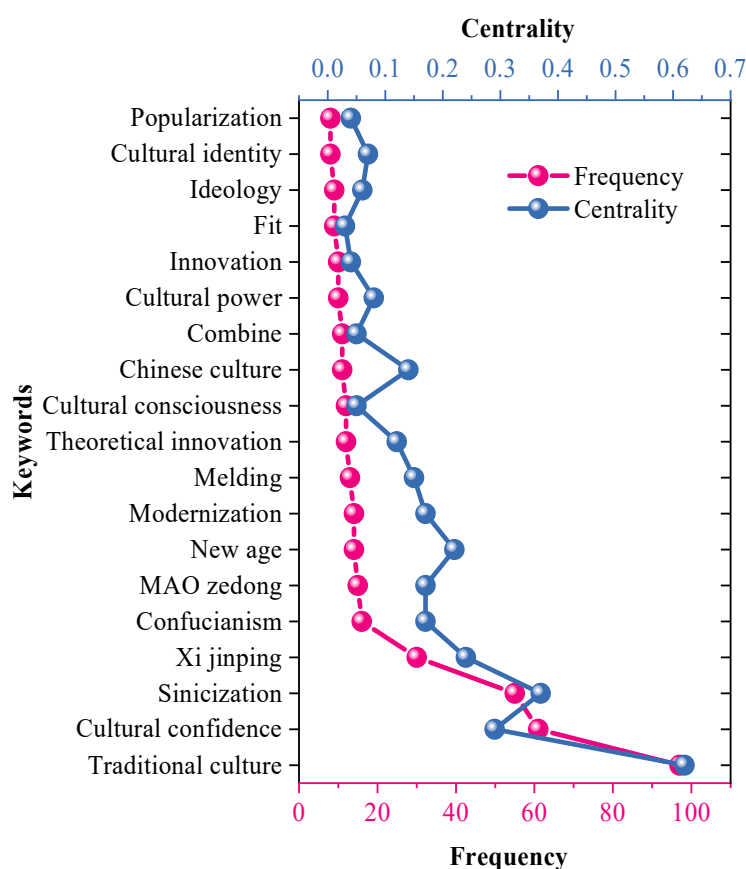


Fig. 5. The results of keywords frequency and the centrality

4.2.3. Analysis of research characteristics. The academic research on the relationship between the Sinicization of Marxism and traditional Chinese culture has shown different research characteristics at different stages of development. On the basis of the keyword co-occurrence map, the keyword co-occurrence time zone map and the keyword emergence map are further drawn, and the keyword intensity at different stages is shown in Figure 6. In terms of keyword intensity, "new era" and "two combinations" have the highest intensity, both above 4, followed by "cultural self-confidence" and "cultural power", with an intensity of 3.73 and 2.82. During the period from 2000 to 2012, the mutant terms mainly included "combination", "Mao Zedong" and "cultural identity", which were mainly based on the perspective of cultural consciousness and cultural identity. From 2012 to 2021,

the main mutation terms were "fit", "cultural consciousness", and "cultural power", and at this stage, we began to explore the convergence point of the combination of the two, and at the same time related them to the political discourse and theory at the macro level. Since 2021, new words such as "two combinations", "theoretical self-confidence" and "Chinese spirit" have appeared, and the issue of the relationship between the Sinicization of Marxism and traditional Chinese culture has begun to be combined with the new formulations and new expositions of party and state leaders.

In general, the new journey of building socialism with Chinese characteristics has put forward many new requirements for the combination of the Chineseization of Marxism and traditional culture. The process of the Chineseization of Marxism should be based on a higher and broader vision, accurately grasping China's past, present and future, and drawing on the essence of the excellent traditional Chinese culture in the process of creative transformation and innovative development, so as to make it into a new form of Chineseized Marxism and to enhance cultural identity.

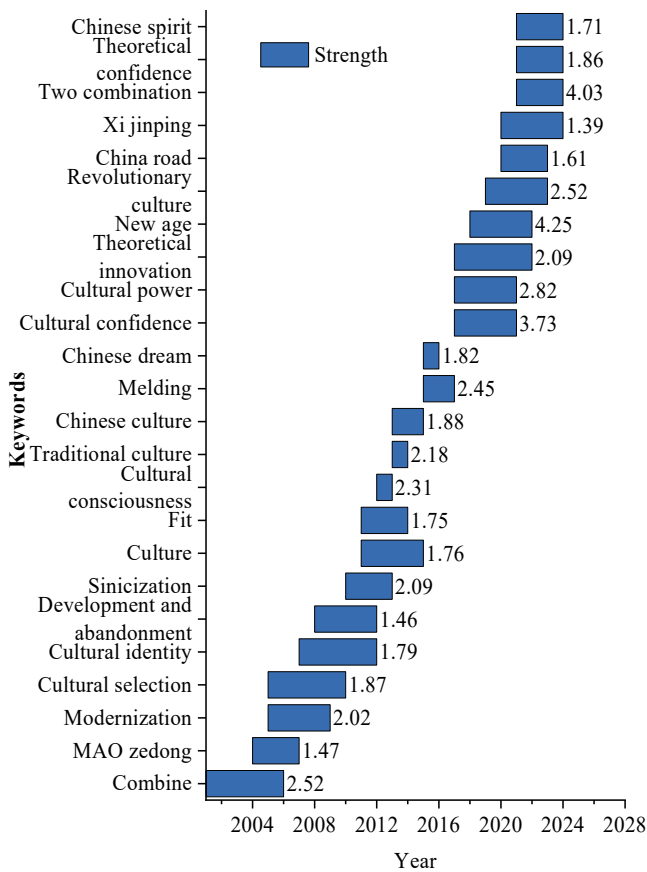


Fig. 6. Keyword strength at different stages

5. Conclusion

Under the joint efforts of generations of Chinese leaders, Marxism has been continuously combined with Chinese practice and Chinese culture. This paper elaborates the cultural identity embodiment of the Chineseization of Marxism from three aspects, out of guaranteeing the construction of material culture, combining the extended Kalman filter algorithm to construct a model to predict and analyze the potential growth rate of China's economy. Then, based on the CNKI database literature, it explores the relationship between the Chineseization of Marxism and Chinese traditional culture by using the measurement method.

From the results of the measurement, the future Chinese economy is in a medium-speed growth

stage, and the potential growth rate will continue to decline, as low as 3%, but will subsequently enter a period of stable development. To strengthen the cultural identity of the Chineseization of Marxism, the reform of the economic system should be pushed forward to promote the development of productive forces and ensure that the identity of Marxist culture is not deviated.

The overall trend of journal paper publication in the study of the relationship between Marxist Chineseization and traditional Chinese culture is on the rise, especially after 2012 when it has experienced explosive growth, with a 3.06-fold enhancement from 2012 to 2021. The development of the research is roughly divided into three stages, in which the combination of the two is discussed based on the perspectives of cultural self-consciousness and cultural identity from 2000 to 2012. Traditional Chinese culture gives Marxist theory a nationalized form of expression, provides important conditions for the spread and development of Marxism in China, and influences the cultural identity of the Chineseization of Marxism.

The Chineseization of Marxism is a dynamic and evolving process, and we should draw inspiration from previous analyses of cultural identity in the process of the Chineseization of Marxism, safeguard the construction of material culture, promote the construction of institutional culture, enhance the construction of spiritual culture, and promote the cultural identity in the process of the Chineseization of Marxism.

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