

A Quantitative Study on the Diffusion Process of Modern Logistic Policy in China

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Abstract

Based on the policy reference network, this paper analyzes the process and characteristics of China's modern logistics policy diffusion using the dimensions and methods of quantitative research on policy diffusion literature. The results show that the intensity of China's modern logistics policy diffusion has led by the postal law and coexistence of multiple policies; the centrally issued logistics policy involves express delivery, agricultural product logistics, and logistics costs. In terms of diffusion breadth, the more authoritative guidance policies have a much wider diffusion than operational policies. This is because of the high level of implementation of the operation can be like, meaning the policy and guidance classes more far-reaching, with guidance for operating class. In terms of diffusion speed, the diffusion speed of operational policies is significantly faster than that of planning policies. In the direction of policy diffusion, since China's modern logistics industry started late, it only showed a top-down model in policy formulation.

Keywords

modern logistics policy; policy diffusion; policy reference network.

1. Introduction

Policy diffusion usually refers to the process by which a policy solution is transmitted from one department or region to another, and is adopted and implemented by the new policy subject [1]. Correspondingly, the research on policy diffusion mainly focuses on the motivations, constraints, diffusion models and characteristics of this process [2]. Since the 1960s, policy diffusion theory has risen in the United States and has made significant progress in the West. It has become a focus of public policy academia and practice, and has promoted the development of policy process theory. In today's society, the advent of the data era and the trend of government information disclosure have accelerated the spread and diffusion of public policy information, providing more practical cases and broader development space for the study of policy diffusion. Public policy scholars began to look for the internal causes and motivations of policy diffusion from the perspective of cases and empirical evidence, and sought to accurately describe the process, model and path of policy diffusion.

Public policy plays a very important role in China's economic and social development. With the continuous increase of the number of public policies in our country, policy proliferation activities between central government departments and local governments are becoming more frequent, which has become an important feature of our public policy activities. Through in-depth study of China's public policy diffusion activities, we can accurately grasp the basic characteristics and laws of China's public policy diffusion, so as to gradually build and improve the public policy diffusion theory based on China's practice. Based on the policy reference network and keyword time series analysis method, based on the analysis of policy document promulgation institutions, promulgation time, keywords and other information,

this paper conducts quantitative research on China's modern logistics policy literature from 2002 to 2019 to explore the diffusion of modern logistics policy in China Process and characteristics.

2. Literature Review

The policy diffusion theory was originally derived from the disciplines of communication, sociology, and information science. With the active promotion of Western scholars such as Walker, Rogers, Grey, Glor, Berry & Berry, the policy diffusion theory developed rapidly and became an important part of public policy research. It is generally believed that the study of policy diffusion originated from Walker [3], an American policy scholar, who pointed out in an article published in 1969 that the government's decision-making in promoting policies was not "progressive" but "innovative" Among them, "innovation" refers to "a project or policy is new to the state that adopted it; no matter how long the project has appeared, and no matter how many other states have adopted the project". The "diffusion model" he proposed assumes state-to-state learning, competition, and public pressure from voters in the state, so state policy adoption is based on mutual emulation. Therefore, he believes that policy diffusion is the introduction of foreign policy knowledge, information, and experience into the local policy process, which has a certain impact on the development of local policies, such as breaking the path dependence of a policy evolution or redesigning a new policy. This concept has been continuously used by scholars since. Policy diffusion is a type of policy process theory. The analysis and discussion of its specific process is the key content of scholars' research. Brown & Cox [4] summarized and proposed three rules of the policy diffusion process, similar to the previous innovation diffusion law in the time dimension, showing the S curve, the spatial dimension as the "proximity effect", and the emergence of "leader-follower" in the region. Tier effect. On this basis, Lucas [1] integrates the viewpoint of the stage theory and divides the policy diffusion process into five stages: policy reinvention, policy development, policy pilot, policy adjustment and policy integration, and he believes that these five stages It does not necessarily show linear characteristics, but may exist across. Gray [5] proposed an empirical model of the process of policy diffusion, and found that the initial stage of policy diffusion was relatively infrequent, and that the proportion of adoption was greatly increased with the influence of various factors. As Berry & Berry [6], Mintro [7] and other scholars continue to study policy innovation and policy diffusion, several models of policy innovation diffusion have been proposed, including the National Interaction Model and regional communication models (The Regional Diffusion Model), Leader-Laggard Model, Vertical Influence Model, etc. Shipan & Volden [8] divided policy diffusion models into two categories: horizontal diffusion models and vertical diffusion models.

Since the twentieth century, Chinese scholars have also begun to pay close attention to the field of policy diffusion. Chen Fang[9] defined policy diffusion as 'the choice of a government's policy being influenced by the choice of other government policies.' Policy diffusion has temporal, spatial, and communication characteristics. Liu Wei[10] summed up the three types of diffusion mechanisms: power diffusion, deontic diffusion, and learning diffusion, profiling each by their defining features. Wang Pupu [11] further refined these notions to produce four modes of China's public policy diffusion: top-down, bottom-up, regional and interregional diffusion, and diffusion from policy advancing areas to policy emulation areas. Based on policy diffusion theory, Wang Hongtao and Wei Shuyan [12] studied the diffusion process of the 49 relatively big municipal and 31 provincial government information disclosure systems, discovering that the diffusion of government information transparency formed an S-shaped curve, with obvious vertical and hierarchical effects; imitation was the main form of diffusion, while innovation types of policy diffusion were insufficient.

In general, scholars at home and abroad mainly use case studies, historical analysis of events, and other research methods to explore the driving force, influencing factors, models, and paths of policy diffusion. With the continuous deepening of research, the theoretical system of policy diffusion is constantly improving, and the application scope is becoming more and more extensive. However, qualitative research methods inevitably have strong subjectivity, uncertainty, ambiguity, and controversy, it is difficult to objectively and accurately describe the process of policy diffusion, and it is difficult to analyze the basic laws and characteristics of policy diffusion in depth. This article takes China's modern logistics policy as an example, based on the policy reference network and keyword time series analysis, from the aspects of policy diffusion intensity, breadth, speed, direction, etc., quantitatively analyzes the process and characteristics of China's modern logistics policy diffusion. Provide theoretical support for improving China's modern logistics industry.

3. Data and Method

3.1. Data

This article collects policy literature related to modern logistics, including central and local policies, from the Peking University Legal Information Network and government websites of provinces, municipalities and autonomous regions. In the process of constructing a housing security policy diffusion literature database, the screening and collation were conducted in accordance with the following principles:

1. Central policies are national policies and regulations formulated by the central legislative and administrative organs, while local policies are rules and regulations formulated by the local, provincial, and municipal administrative and legislative organs;
2. The types of policies mainly include laws, plans, opinions, measures, detailed rules, regulations, announcements, notices, and so on. Not included are leaders' speeches, letters, and industry standards.

A total of 764 modern logistics policies were selected from 2002 to 2019, including 77 central policies and 687 local policies.

3.2. Method

3.2.1. Policy Reference Network

The references between policies are similar to those in the literature. The title of the referenced policies and regulations will be listed in the reference policy in the reference policy. The reference relationship mainly includes the central agency's reference to other central agencies' policies and regulations, and the local government's reference to the central government. Institutional policies and regulations are two. For example, the "Notice of Heilongjiang Provincial Department of Commerce on Printing and Distributing the Implementation Opinions on Promoting the Development of the Commercial Logistics Industry in Heilongjiang Province" issued in 2017 mentioned: -2020) "(Guo Fa [2014] No. 42), Ministry of Commerce" Implementation Opinions on Promoting the Development of Commercial Logistics "(Commercial Circulation Letter [2014] No. 790), and now proposes to promote the development of Heilongjiang Province's commercial logistics industry The following comments: "... can be regarded as a reference relationship between policy documents. The above Heilongjiang Province policy is the reference policy, and the central policy is the reference policy. In this paper, through comparison and screening, 614 pairs of housing security policy literature reference relationships were finally obtained, and a policy reference network was constructed on this basis.

3.2.2. Research Dimensions of Policy Diffusion

This article mainly draws on the research methods of scholars such as Huang Cui [13], analyzes from the four dimensions of intensity, breadth, speed, and direction to describe the spread of housing security policy objectively and systematically. Among them, the intensity of policy diffusion is a description of diffusion based on the frequency of the diffusion path, including absolute strength and relative intensity; the breadth of policy diffusion is a description of diffusion based on coverage, including absolute and relative breadth; the speed of policy diffusion is divided into The speed of intensity diffusion and breadth diffusion refers to the vertical speed of the policy that is referenced by other policies. The latter refers to the lateral speed of the policy's spread among different institutions. Since the policy-promulgation agencies include the central and local governments, the policy diffusion direction includes three types: top-down, bottom-up, and parallel diffusion. However, due to the characteristics of modern logistics policy, its policy diffusion direction is only top-down.

4. Result

4.1. Intensity of China'S Modern Logistics Policy Diffusion

The absolute intensity of the policy diffusion indicates reference frequency N_i , which can be directly obtained through the policy reference network. In the policy reference network in this study, there are 815 pairs of reference relationships, so the total reference frequency of the policy C_{it} is 614. The relative intensity of each policy can be calculated as N_i/C_{it} . Table 1 shows that among the 10 modern logistics policy documents with the highest intensity of diffusion in China

Table 1. Three Scheme comparing

Numble	Policy name	Issuing body	Issuing time	Absolute intensity	Relative intensity
1	Postal Law of the People's Republic of China (2015 Amendment)	NPC Standing Committee	2015.04.24	121	0.1485
2	Opinions on Promoting the development of express industry	State Council	2015.10.23	96	0.1178
3	The State Council Opinions on Promoting Development of Circulation Industry	State Council	2005.06.09	94	0.1153
4	Opinions of the General Office of the State Council on Policies and Measures to Promote the Healthy Development of the Logistics Industry	Office of the State Council	2011.08.02	76	0.0932
5	Notice of the State Council on Issuing the Plan for the Adjustment and Revitalization of the Logistics Industry	State Council	2009.03.10	53	0.0650
	Opinions of the General Office of the State				

6	Council on Strengthening the Construction of the Distribution System of Fresh Agricultural Products Notice of the General Office of the State Council on Issuing a Comprehensive Work Plan to Reduce Circulation Costs and Improve Circulation Efficiency	Office of the State Council	2011.12.13	52	0.0638
7	Circular of the General Office of the State Council on the Ministry of Transport and other departments' opinions on promoting the development of rural postal logistics	Office of the State Council	2013.01.11	36	0.0442
8	Notice of the State Council on Printing and Distributing the Medium- and Long-Term Plan for the Development of the Logistics Industry (2014-2020)	Office of the State Council	2009.05.23	36	0.0442
9	Opinions of the General Office of the State Council on Further Promoting Logistics Cost Reduction and Efficiency Improvement to Promote the Development of the Real Economy	State Council	2014.09.12	34	0.0417
10		Office of the State Council	2017.08.07	34	0.0417

It can be seen from Table 1 that the policy with the highest proliferation intensity is the "Postal Law of the People's Republic of China (2015 Amendment)", and only this one of the logistics policies is a legal policy. This is because China's modern logistics also started late, and a relatively complete legal system has not yet been formed.

The current effective policies regulating the logistics industry are mostly opinion policies, such as "Several Opinions on Promoting the Development of the Express Delivery Industry" and "Several Opinions on the Development of the Circulation Industry by the State Council". The two policies have a diffusion intensity of two or three. They play a programmatic role in the "Several Opinions on Promoting the Development of the Express Delivery Industry" released in 2015, and have clear guidelines for local policies in the express delivery industry, but It has only the role of guiding opinions, and no standardized and specific implementation measures have been formed. Correspondingly, the "Interim Regulations on Express Delivery (2019 Amendment)" issued in 2019 more clearly stipulates the relevant regulations of the express delivery industry. It is an amendment to the 2015 version of the "Opinions". Due to

the late release, it is not yet in place. Formed a normative document, so it is not included in this table.

It is also worth noting that the policies ranked 6th and 9th specifically target rural logistics and agricultural product logistics, which shows that China attaches importance to agricultural modernization and agricultural product logistics. The eighth and eleventh policies are aimed at the problem of high costs in the current logistics and circulation field in China, and emphasize the need to reduce costs and increase efficiency in logistics activities to promote the development of the real economy.

4.2. Breadth of Modern Logistics Diffusion (Top 10 Absolute Intensity)

Policy Diffusion Breadth (PDB) describes diffusion from the perspective of coverage, that is, the larger the coverage, the greater the breadth. Similar to the intensity of policy diffusion, the breadth of diffusion is also divided into absolute breadth (Absolute Breadth, AB) and relative breadth (RB). The absolute breadth of a single policy diffusion refers to the number of policy institutions, and the relative breadth refers to the absolute breadth and The policy sample focuses on the ratio of the sum of the number of institutions. The absolute breadth of policy diffusion refers to the number of policy agencies, which can be obtained through the policy enactment agency's reference network; the policy enactment agency's reference network includes the National People's Congress Standing Committee, the CPC Central Committee, the State Council, the Ministry of Commerce, the Ministry of Transport, the Development and Reform Commission and other central authorities There are 17 government agencies and 31 local government agencies such as provinces, municipalities, and autonomous regions. Therefore, the total number of agencies involved in the policy sample concentration is 48. The relative breadth of each policy can be calculated through $\frac{AB}{48}$. It was found through calculation that in the logistics policy issued by the central government agency, the average relative diffusion breadth of the guidance policy (11 cases) was 0.7614, and the average relative diffusion breadth of the operation policy (19 cases) was 0.2522, which indicates a higher authority. The guidance policy has a much wider spread than the operational policy. This is because the operational category has a high degree of implement ability, and the guiding policy has a far-reaching significance and has guiding significance for the operating category.

Among the guiding policies, "Several Opinions on Promoting the Development of the Express Delivery Industry" has the highest diffusion intensity; among the operating policies, the "Statement's Notice on Printing and Distributing the Logistics Industry Adjustment and Revitalization Plan" has the highest diffusion intensity. Therefore, this article uses these two policies as examples to measure the breadth of policy diffusion and analyze its characteristics. As shown in Figure 1, the number of institutions referring to "Several Opinions on Promoting the Development of the Express Delivery Industry" is 31, of which 3 are central agencies and 28 are local agencies. The absolute spread width is 34 and the relative spread width is 0.6485; The number of institutions of the "State Council's Notice on the Adjustment and Revitalization of the Logistics Industry" is 31, of which 5 are central agencies and 26 are local agencies. The absolute spread is 32 and the relative spread is 0.6458.

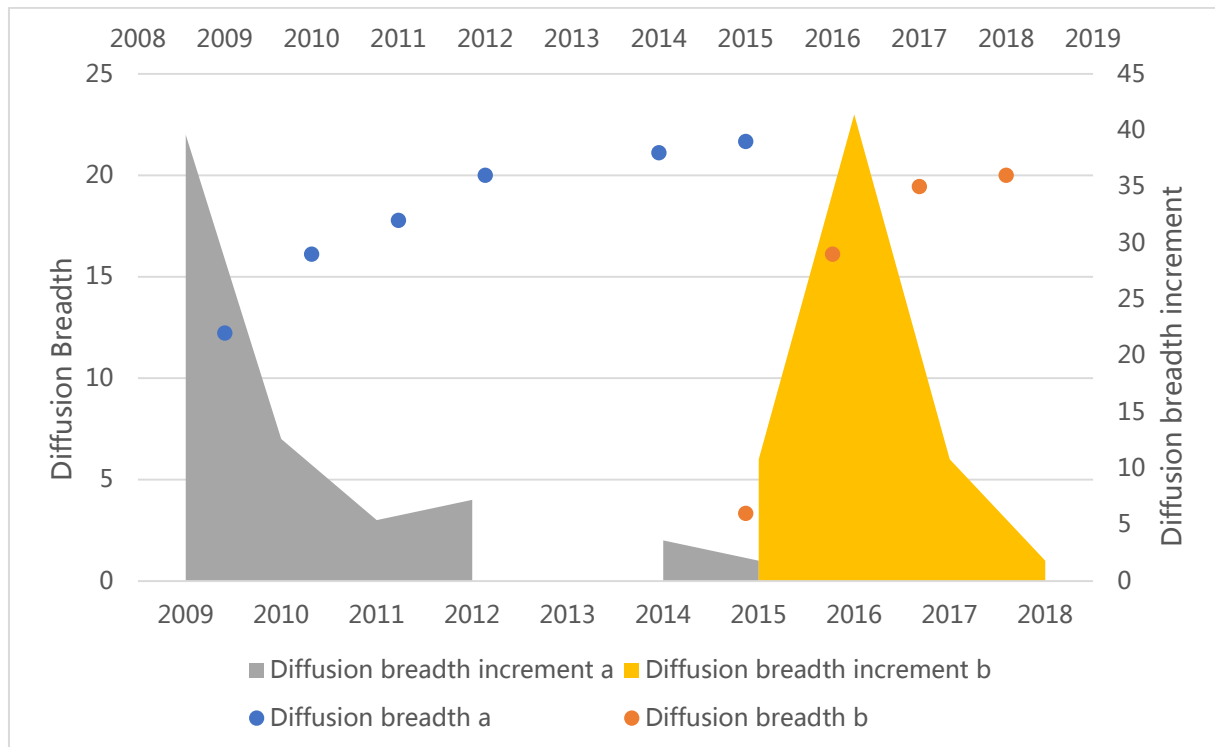


Fig. 1 The breadth of policy diffusion and its incremental comparison (a means "Notice of the State Council on Issuing the Plan for the Adjustment and Revitalization of the Logistics Industry"; b means "Several Opinions on Promoting the Development of the Express Delivery Industry")

As shown in the area chart in Figure 1, the increase in the breadth of the "Notice of the State Council on Printing and Distributing the Logistics Industry Adjustment and Revitalization Plan" reached its maximum in the early stage of the proliferation, that is, in 2009, and it became saturated in 2015 after 7 years of proliferation. The proliferation breadth of "Several Opinions on Promoting the Development of the Express Delivery Industry" was not significant in the year when it was promulgated in 2015, and reached a maximum of 29 in the second year of its promulgation, that is, in 2016. The proliferation breadth has decreased sharply in the following years, until it is saturated. . It can be seen that both present an instantaneous burst-type breadth diffusion pattern.

4.3. Diffusion Speed of China’s Modern Logistics Policies

Policy Diffusion Speed (PDS) describes diffusion from a speed perspective. For a given diffusion target, the shorter the time taken, the faster the diffusion speed. The speed of policy diffusion is divided into Intensity Diffusion Speed (IDS) and Breadth Diffusion Speed (BDS). The intensity diffusion speed is calculated by the ratio of absolute diffusion intensity to the number of years of policy promulgation, and the breadth diffusion speed is determined by absolute diffusion breadth. Calculated with the number of years of policy enactment. Based on the calculation of the intensity and breadth of policy diffusion, the speed and characteristics of the "Notice of the State Council on Printing and Distributing the Logistics Industry Adjustment and Revitalization Plan" and "Several Opinions on Promoting the Development of the Express Delivery Industry" were measured and analyzed. The speed of policy intensity diffusion indicates the vertical speed of the designated diffusion path, and the policy breadth diffusion speed indicates the lateral speed of policy diffusion between different institutions. As of 2019, the "State Council's Notice on Printing and Distributing the Logistics Industry Adjustment and Revitalization Plan" has been issued for 10 years. The absolute intensity of its policy diffusion

is 53, the absolute breadth is 31, and the speed of intensity diffusion and breadth diffusion are 5.3, 3.1. The "Several Opinions on Promoting the Development of the Express Delivery Industry" has been issued for four years. The absolute intensity of its policy diffusion is 96, the absolute breadth is 31, and the speed of intensity diffusion and breadth diffusion are 24 and 7.75, respectively. It can be seen that the former is slower than the latter in both the intensity diffusion speed and the breadth diffusion speed.

Figure 2 can more clearly show the change characteristics of the diffusion rate of two different types of policies: planning and operation.

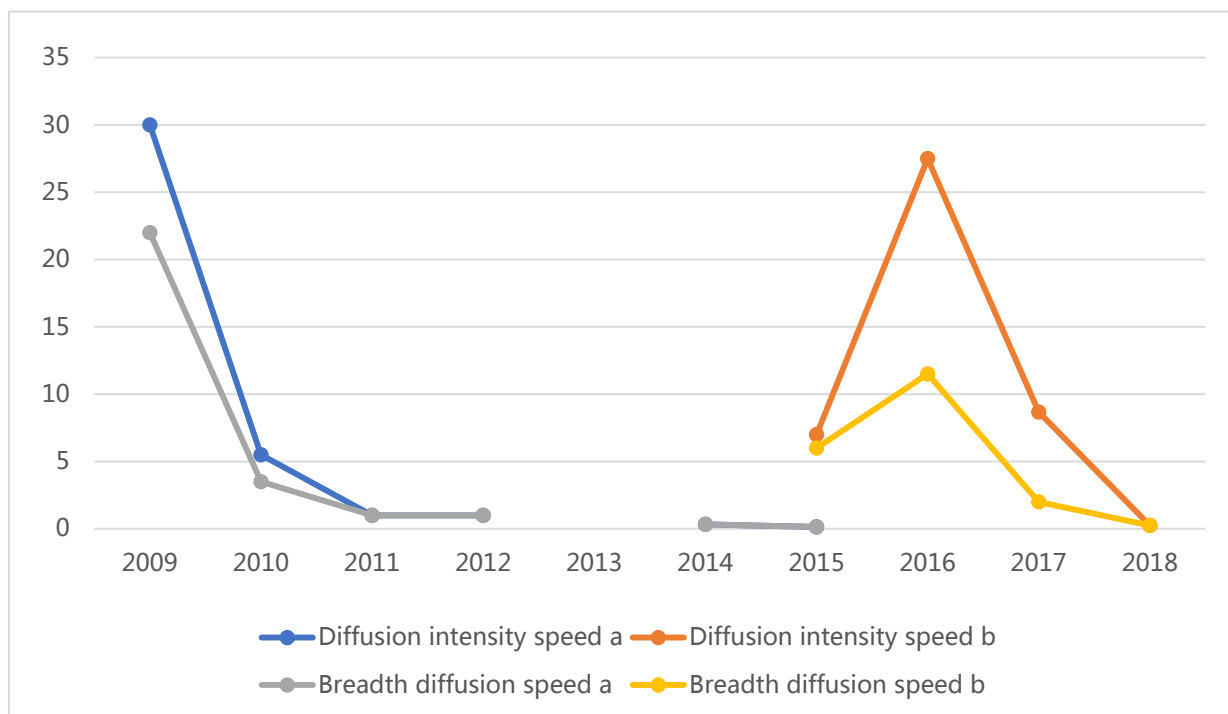


Fig. 2 Comparison of the speed of policy diffusion and the speed of breadth (a means "Notice of the State Council on Issuing the Plan for the Adjustment and Revitalization of the Logistics Industry," b means "Several Opinions on Promoting the Development of the Express Delivery Industry")

Figure 2 can more clearly show the characteristics of the proliferation rate of different types of policies in the planning and operation categories. Similar to the incremental change in the breadth of policy diffusion in Figure 1, the State Council's Notice on Printing and Distributing the Logistics Industry Adjustment and Revitalization Plan has the largest rate of intensity spread and breadth spread in the year it was promulgated, and has declined year after year. The speed of intensity and breadth of the "Several Opinions on Promoting the Development of the Express Delivery Industry" reached its maximum in the year after its promulgation and then declined year after year.

4.4. Diffusion Direction of China's Modern Logistics Policy

The diffusion direction of China's logistics policy is top-down, that is, the logistics policies formulated by the State Council and the central ministries and commissions have spread to provincial and municipal administrative units. At present, China's logistics policy has not spread from bottom to top, which indicates that provincial and municipal administrative units are not enthusiastic in formulating logistics policies. Therefore, in the future development, provinces and cities should vigorously develop the logistics industry and formulate corresponding policies based on the characteristics of each province. If pilot cities for smart

logistics can be launched, they will spread from one point to the whole country. Taking Shaanxi Province as an example, Shaanxi Province is a pilot province for drone distribution. The Shaanxi Provincial Government should actively respond and formulate corresponding drone distribution policies, so as to provide a reference for the subsequent national policies.

5. Summary

This paper believes that by using the policy reference network, the process and characteristics of public policy diffusion can be objectively presented from the four dimensions of intensity, breadth, speed, and direction, providing effective verification and supplement for the nature of this type of policy diffusion. Among them, the intensity and breadth of diffusion characterize the influence of policies, the speed of diffusion reveals the motivation of government adoption of policies from the side, and the direction of diffusion reflects the flow of policy knowledge and information among government agencies. This analytical framework and quantitative research methods not only provide new perspectives and ideas for the study of social policy diffusion, but also reaffirm the applicability of the quantitative research methods of policy literature proposed by scholars such as Huang Cui in public policy research. Develop the domestic public policy diffusion theory.

Through the empirical analysis of the diffusion of China's housing security policy, we can find that the diffusion intensity of modern logistics policy in China presents the characteristics of the postal law, coexistence of multiple policies; the centrally issued logistics policy involves express delivery, agricultural product logistics, and logistics costs. In terms of diffusion breadth, the more authoritative guidance policies have a much wider diffusion than operational policies. This is because the operational category has a high degree of implementability, and the guiding policy has a far-reaching significance and has guiding significance for the operating category. In terms of diffusion speed, the diffusion speed of operational policies is significantly faster than that of planning policies. In the direction of policy diffusion, since China's modern logistics industry started late, it only showed a top-down model in policy formulation. In short, through quantitative research on the diffusion of modern logistics policies in China, we can not only deeply understand the phenomenon and laws of the diffusion of modern logistics policies, provide suggestions for the promotion of modern logistics in China, but also help to discover The proliferation situation and characteristics can further reveal the complex and subtle cooperative game relationships among policy enacting institutions.

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