

Evaluation of the COVID-19 Relief Policy in China: Based on Content Analysis and PMC Index Model

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Abstract

By evaluating the COVID-19 relief policy, it can provide an important reference for the government to optimize the emergency decision. Taking 147 central and local epidemic relief policies as text analysis data, this paper uses content analysis method and PMC index model method to mine the main characteristics of policy texts from three dimensions: release subject, policy effectiveness and policy tools. The results show that most of the release subjects of China's COVID-19 relief policies are released separately, which weakens the overall coordination of the policies. The effectiveness index of China's COVID-19 relief policy is generally good at all latitudes, but the index distribution is uneven. The use of various policy tools in China's COVID-19 relief policy is unbalanced. Based on the above policy quantitative evaluation results, this paper puts forward policy optimization measures.

Keywords

COVID-19; Relief Policy; Content Analysis; PMC Index Mode.

1. Introduction

The global spread COVID-19 has caused a major death disaster for the world population. The new crown pneumonia epidemic has been characterized by rapid outbreak and spread. Its characteristics of strong infectivity, high risk coefficient and difficult prevention and control not only do great harm to the physical and mental health of the people, but also have a great impact on the operation of the national economy(Wang and Gao, 2020). In order to deal with this sudden epidemic for the first time, the central and local governments have issued a series of relief policies for the epidemic from the aspects of finance, health, finance and enterprise management, coordinated epidemic prevention and control and economic and social development, and minimized the threat of the epidemic to social production and people's health. By combing the internal characteristics of the epidemic relief policy formulated by the government, and explore the COVID-19 relief policy deployment characteristics and deficiencies. This is of great practical significance to mprove China's public health emergency response policy mechanism and improve the government's comprehensive ability of emergency management.

2. Literature Review

The COVID-19 relief policy is a series of response policies issued by central and local government units to deal with the COVID-19. Since the outbreak of the COVID-19, the central and local governments have successively issued a series of response measures and policies in combination with the development trend of the epidemic. There are also many academic interpretations and research results of relevant policies. From the perspective of research methods, the existing research on COVID-19 relief policies is mainly divided into two categories.

The first is the expert experience interpretation method. This method mainly relies on the knowledge literacy and historical experience of experts and research scholars to accurately interpret the COVID-19 relief policy from the perspective of knowledge and experience. Comparing the COVID-19 and SARS, it demonstrates the rationality and urgency of stable employment, stable foreign trade and stable foreign investment policy during COVID-19 period (Shen, 2020). Referring to the epidemic situation of SARS in 2003, it put the COVID-19 relief policy in a higher strategic position, and put forward the upgrading of the tourism risk management system during the COVID-19 period (Xia and Feng, 2020). The COVID-19 outbreak should be fully considered in the relevant policies, which will have a negative impact on the development of the agricultural industry such as planting and aquaculture, fruit and flower industry (Jiang, Yang and Guo, 2020).

The second is the policy quantification method. The text policy is quantified as structured data, and the rationality and scientificity of the policy are tested by building a model and big data analysis method. By constructing CGE model, it analyzes the rationality of the government's macro policy to deal with the COVID-19 situation (Zhou, Liu, Jin et al., 2020). Combined with Baidu big data and double difference (DID) model, it tests the effectiveness of the return to work and production policy (Zhang, Zhuo and Dong, 2020). By constructing the vector autoregressive model of COVID-19 impact, it simulates the impact of epidemic situation on macro economy and the effect of fiscal policy and portfolio policy on hedging epidemic situation (Zhang, 2020). Combined with entropy weight method and TOPSIS method, it verifies the impact of financial policy and financial foundation on socio-economic recovery during the epidemic (Du and Zhao, 2020).

3. Policy Text Selection and Research Design

3.1. Policy Text Selection

In early 2020, it was the early outbreak of the COVID-19. The policies released during this period concentrated on the measures taken by the government to contain the COVID-19 during the outbreak period. The interpretation of COVID-19's response policy helped to optimize the public health risk prevention and control system. This paper selects the relevant policy texts of central and local governments in response to COVID-19 in February 2020, which is representative. The policy text comes from the official websites of the central and local provinces and cities. The main body of the document includes the National Health Commission, the tax bureau, the tourism administration, the people's government, etc. the sample is extensive. After screening, 147 policy texts were selected.

3.2. Research Dimension

(1) Policy effectiveness

Policy effectiveness refers to the legal effectiveness, strength and influence of a published policy. Referring to the Zang and Zhang's research methods in 2021, this paper quantifies the COVID-19 relief policy through PMC index model. PMC index model extracts primary and secondary variables through text mining to accurately quantify single or multiple text policies, so as to improve the accuracy of quantitative evaluation. This paper uses PMC index model to quantitatively evaluate the COVID-19 relief policy, and analyzes the advantages and disadvantages of each dimension of the COVID-19 relief policy in terms of policy effectiveness.

(2) Policy tools

Policy tools are the means and ways for the government to achieve policy objectives. This paper divides the COVID-19 relief policies into three types: supply-oriented, demand-oriented and environment-oriented. The supply-oriented policy tools can be compared to a "driving force" to promote the COVID-19 relief process through capital, personnel, technology and innovation.

The demand- oriented policy tool can be compared to a "pulling force" to pull the COVID-19 relief process through government procurement, foreign procurement, import and export and donated materials. The environment-oriented policy tools can be compared to a "force" to guide and support the implementation of COVID-19 relief policies through government work deployment and various boost policies.

4. Quantification and Analysis of Policy Text

4.1. Policy Effectiveness

The policy effectiveness of this paper is measured by PMC index, which can reflect the overall effectiveness of the formulated policies. Ruiz is the first scholar to propose and construct PMC index model, which provides an effective method to evaluate policy effectiveness (Ruiz, 2007). This paper calculates the PMC index of the COVID-19 relief policy and visualizes it to reflect the effectiveness of the epidemic relief policy and the advantages and disadvantages of the policy itself. The primary task of calculating PMC index is to construct indicators and parameters, then calculate the index of the policy to be evaluated, and finally carry out visual evaluation according to the index. This paper selects 8 typical policy texts from 147 typical epidemic relief policies as evaluation data, which are recorded as H1, H2, H3, H4, H5, H6 respectively. See Table 1 for details.

Table 1. Represents the summary of policies

Number	Institution	Name of the policy
H1	General Letter of Tax (2020) No. 19	Notice of the State Administration of Taxation on optimizing tax payment services to cooperate with the prevention and control of new coronavirus infection pneumonia outbreaks
H2	Treasure (2020) No.5	About winning the epidemic prevention and control resistance war Strengthen the epidemic prevention and control key to ensure the enterprise's financial support of the emergency notice
H3	Ministry of Human and Social Affairs Mingdian (2020) No. 2	Ministry of Human Resources and Social Security Ministry of Education Ministry of Finance Ministry of Transport National Health Commission on doing a good job during the prevention and control of the epidemic related to employment notice
H4	Municipal Office issued (2020) No. 7	The General Office of the Beijing Municipal People's Government has taken a number of measures to cope with the impact of the outbreak of pneumonia with new coronavirus infection and promote the sustained and healthy development of small and medium-sized enterprises
H5	bank(2020) No.29	on further strengthening financial support for the prevention and control of new coronavirus infection pneumonia outbreaks
H6	National Invention Electric Power (2020) No. 7	Notice of the Central Leading Group on The Response to the Outbreak of New Coronary Virus Infection Pneumonia on the Issue of the Current Guidelines for Spring Farming Production

(1) Construction indicators and parameters

The primary indicators constructed in this paper are based on the research results of Ruiz et al. (Ruiz et al., 2007), and the secondary indicators are constructed from the primary indicators of policy perspective, policy timeliness, policy nature, policy evaluation, policy tendency, action mode, action field, action object and action function. The secondary indicators of this paper are based on the research results of Liu in 2021 (Liu et al., 2021), combined with the coding theme

of NVivo's COVID-19 relief policies. See Table 2 for the construction results of primary and secondary indicators. See formula (3) for specific numerical operation rules.

$$X \sim N[0,1] \quad (1)$$

$$X = \{XR:[0 \sim 1]\} \quad (2)$$

$$X_p \left[\sum_{q=1}^n \frac{X_{pq}}{T(X_{pq})} \right] \quad (3)$$

Table 2. PMC model evaluation index

Indicator	Secondary indicators		
Policy perspective X1	X1-1Macro perspective	X1-2mid-view perspective	X1-3Microscopic perspective
Policy limitationsX2	X2-1short term	X2-2 medium term	X2-3 longterm
Policy natureX3	X3-1 prediction X3-4 guarantee	X3-2 regulation X3-5 boot	X3-3 recommendations
EvaluationX4	X4-1Well-founded	X4-2 Clear goals	X4-3The plan is detailed
Policy preference X	X5-1 encouragement X5-4 guarantee	X5-2 supervision	X5-3 boycott
How it worksX6	X6-1 Forced	X6-2 Service type	X6-3 Incentive
Area of actionX7	X7-1 Economy X7-4 Innovation	X7-2 politics	X7-3 serve
Object X8	X8-1 country X8-4 Enterprise	X8-2 zone X8-5 People	X8-3 Industry
Function X9	X9-1working deployment X9-5 funds, financial support	X9-2re-employment policy X9-4Medical Treatment	X9-3protection normalization X9-6 Life Support

(2) PMC index calculation

Formula (4) shows the algorithm for calculating PMC index. P in formulas (3) and (4) refers to the primary index of this study, and its value shall be a positive integer. q is the secondary index of this study, and the value requirement is also a positive integer. The primary indicators specified in this study are policy perspective ((x1)), policy timeliness (x2), release nature (x3), policy evaluation (x4)... function (x9), etc. after the selected policy analysis samples are calculated according to formula (4), the PMC index can be used as the basis for policy effectiveness evaluation. The PMC index calculated in this study is shown in Table 3.

$$PMC = \sum_{p=1}^9 \left\{ X_p \left[\sum_{q=1}^n \frac{X_{pq}}{T(X_{pq})} \right] \right\} \quad (4)$$

According to the calculation rules of PMC model, PMC value and depression index value can be obtained. Depression index is the difference between 9 and PMC index. Depression index explains the gap between policy and perfect policy. Table 3 shows the calculated PMC index values and depression values of the eight policies to be evaluated in this study. In order to accurately compare the effectiveness of various policies, we can directly compare the PMC index values. The greater the index value, the greater the effectiveness of the policy, that is, the policy has better scientific and accurate appeal.

As shown in Table 3, from a policy perspective, policies H3, H5 and H6 cover three levels: macro level, meso level and micro level, which shows that the starting point of these policies is relatively comprehensive and the content levels covered by the policies are extensive. Policies H2 and H4 cover two levels, and policy H1 covers one level. In terms of policy timeliness, policy evaluation and action object, the index distribution is relatively uniform, and the overall score is high.

Table 3. PMC index

Policy	X1	X2	X3	X4	X5	X6	X7	X8	X9	PMC	Number	Index
H3	1	1	0.6	1	0.5	0.67	0.5	1	0.4	6.67	2	2.33
H5	1	1	0.4	1	0.25	0.67	0.25	1	0.6	6.17	4	2.83
H6	1	0.67	0.8	1	0.25	0.67	0	1	0.6	5.99	5	3.01
H1	0.33	1	0.4	1	0.25	0.67	0.5	1	0.6	5.75	6	3.25
H2	0.67	1	0.6	1	0.5	0.67	0.25	0.6	0.4	5.69	7	3.31
H4	0.67	1	0.6	1	0.25	0.67	0.25	0.6	0.4	5.44	8	3.56

4.2. Policy Tools

As can be seen from table 4, China's epidemic relief policy mixes three policy tools, and the comprehensive use of policy tools is the key to the success of China's effective response to the COVID-19. The proportion of the three policy tools is quite different. Environment-oriented policy tools have the largest number of applications, a total of 1193, accounting for 48.30%. The application of supply-oriented policy tools came second, with a total of 895 items, accounting for 36.20%. The demand-oriented policy tools are the least used, with 384 items in total, accounting for 15.50%.

(1) Supply-oriented policy tool

In terms of the proportion of tool categories of policy tools, the relief policies formulated by the government during the epidemic also focus on the use of tool categories. Among the supply-oriented policy tools, public service and innovation are used most frequently, which shows that the government attaches the most importance to public service in the process of COVID-19 prevention and control, and always puts the maintenance of public interests in an important position of the policy. The government ensures the basic living needs of the people by consolidating all kinds of public service guarantee. During the COVID-19 period, we innovated the service mode, improved and optimized a series of convenient service measures by introducing big data and emerging technology, and solved the public's needs during the COVID-19 period. The use frequency of financial and credit support, material support for prevention and control, and production planning and construction is similar, which shows that the government has provided financial and credit support to enterprises and individuals affected by the epidemic in order to maintain the normal operation order of the country.

(2) Demand-oriented policy tool

Among the demand-oriented policy tools, COVID-19 protection measures are most used, which reflects the comprehensive planning made by the government to fight the COVID-19, and build a solid joint protective barrier for the fight against the COVID-19 through communication and

cooperation with various departments and fields in conjunction with transportation, medical treatment, finance, education, public security, justice and other departments. In addition, through the responsibility system, the government ensures the smooth implementation of various policies and comprehensively and efficiently promotes the anti epidemic process. During the COVID-19 period, the government also paid equal attention to the supervision of the market, paid attention to the price increase in special periods, prevented criminals from infringing on public rights and interests, and resolutely cracked down on the speculation of "making a country difficult to make money".

(3) Environment-oriented policy tool

The most used environment-oriented policy tools are management policies, including the management of regional industrial economy, the management to ensure that enterprises can successfully overcome difficulties, and the management to ensure the implementation of various policies. Work deployment is also a tool with high frequency. The state attaches importance to the deployment of spring ploughing, education and medical treatment, so as to reduce the impact of the COVID-19 on various national production work and ensure the smooth operation of various national work. Fiscal policy, financial policy, return to work and job stabilization policy and other tools are used less frequently, because fiscal policy and financial policy belong to the macro scope, and the state mostly gives them macro guidance in terms of policy. In addition, in the outbreak stage, the government mostly encourages online office in order to reduce the infection cases caused by work.

Table 4. Distribution of policy tools

Policy Tools	Tool Category	Number of responses	Percentage Total	Total	Total Share
Supply-oriented	Public Service and Innovation	404	45.14%	895	36.20%
	Financial and credit support	139	15.53%		
	Epidemic prevention and control materials protection	134	14.97%		
	Staffing	78	8.72%		
	Production planning and construction	140	15.64%		
Demand-oriented	public-private partnerships	47	12.24%	384	15.50%
	Market regulation	130	33.85%		
	Donations and imports and exports of materials	39	10.16%		
	Epidemic safeguards	159	41.41%		
	Government procurement	9	2.34%		
Environment-oriented	Work deployment	265	22.21%	1193	48.30%
	Fiscal policy	89	7.46%		
	Financial policy	60	5.03%		
	The policy of re-entry and steady-post	28	2.35%		
	Management policy	751	62.95%		

5. Conclusions and Recommendations

5.1. Improve the Effectiveness Index of Policy Dimensions

Through PMC index, it is found that there is still much room for improvement in China's COVID-19 relief policy. The COVID-19 relief policy is relatively low in its function and field, and it can not play a specific role in complex practice. The characteristic of low policy comprehensiveness makes the policy lack of predictability and can not provide policy guidance for emergencies,

which makes the rescue policy in a passive position. Therefore, the government should consider the impact of the COVID-19 situation to the greatest extent, reasonably predict the difficulties caused by the COVID-19 situation, and prospectively formulate an all-round and multi field COVID-19 relief policy. In addition, the policy tendency of China's COVID-19 relief policy is relatively single.

5.2. Balancing the Use of Various Types of Policy Tools

The policy tools of China's epidemic relief policy are mainly environment-oriented policy tools. The government creates conditions for the resumption of production at any time during the epidemic prevention and control period through a series of measures such as work deployment and the policy of returning to work and stabilizing posts. The government should continue to stabilize the domestic market order through fiscal and financial policies, return to work and stabilize posts and enterprise management policies, and provide policies, regulations and economic capital guarantees for domestic business entities to help them resume normal business activities. China also uses more supply-oriented policy tools to promote the process of COVID-19 prevention and control through the supply of capital, personnel, materials and other resources. When using supply-oriented policy tools, we should pay more attention to talent training and talent allocation, pay attention to improving the professional quality of personnel, and improve the salary and logistics support system of professional medical personnel, production staff and protection staff. In the COVID-19 relief policy, demand-based policy tools are rarely used.

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