

Statistical Analysis of Wenzhou Municipal Innovation Policy

-- Based on the Data of Recent 10 Years

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Abstract: In 2022, under the dual influence of the COVID-19 and the international situation, China's economic development pressure will continue to rise. China has always regarded "innovation" as the core of its national development strategy. With the implementation of Wenzhou's strategy of creating "two healthy" pilot areas in the new era, Wenzhou has put forward many innovative policies. This research intends to collect the innovation policy texts issued by Wenzhou in the past, analyze the characteristics and direction of innovation policy formulation in Wenzhou through word frequency statistical analysis and word cloud map construction, and draw conclusions. The research found that the main direction of innovation policy formulation in Wenzhou is to use innovation to promote Wenzhou's industrial transformation and upgrading and high-quality economic development, including Zhejiang manufacturing, digitization, intelligence, independent innovation and other keywords. Furthermore, Wenzhou Municipal Government can improve the design concept and method of innovation policy from four aspects.

Keywords: Innovation policy, Text research, Word frequency statistics, Word cloud chart.

1. Research Background and Significance

2022 is the second year of the beginning of the "Fourteenth Five Year Plan", and also a key year for achieving the 10 billion goal of the "Fourteenth Five Year Plan" ahead of schedule. In the face of the increasing downward pressure on the current world economy, especially the impact of the COVID-19 epidemic, the world economy, including China, is in a sluggish state. Although China's active and effective anti epidemic measures and measures have helped China quickly recover its economic development, the corresponding risks still exist. Under the guideline of "adhering to the innovation driven development strategy", the "Fourteenth Five Year Plan" puts forward construction ideas and requirements for the development of modern industrial system, the development of new market patterns, and the comprehensive deepening of reform.

Wenzhou is a city "started" by private economy. Since the implementation of the 13th Five Year Plan, Wenzhou has adhered to open development, seized the opportunity of the national implementation of innovation driven development strategy, the "the Belt and Road" initiative and the Yangtze River Economic Belt strategy, and implemented a more proactive innovative development strategy. With the implementation of the "two health" pilot zone strategy for Wenzhou to create a new era, Wenzhou has delivered satisfactory answers. By the end of 2020, Wenzhou has focused on the "common troubles" of the growth of private enterprises and entrepreneurs, explored more than 40 reproducible experiences and more than 120 innovative initiatives that can be replicated and promoted in the province and even across the country, and provided an important force

for Wenzhou's economic development.

Innovation is still the key to the development of Wenzhou during the "14th Five Year Plan". Therefore, this study focuses on "innovation". It is intended to study the innovation policies in Wenzhou in recent years, especially since the implementation of the strategy of creating a "two healthy" pilot area in the new era, make statistical analysis of the contents of these innovation policies, and build a word frequency network map, which has certain practical significance for the formulation, promulgation and implementation of innovation policies in Wenzhou's industries; Furthermore, it also provides some reference for the improvement of the innovation ability of Wenzhou's industries and the ability to resist the downward pressure of the economy.

2. Selection of Policy Variables

Since the reform and opening up, Wenzhou has written many miracles of Wenzhou by virtue of its private economy. It has created a Wenzhou economic development model that takes the people based economy as the essence, the market economy as the essence, the real economy as the cornerstone, and the limited and effective as the core of government governance. As a port model sensitive to changes in the market, Wenzhou has become one of the earlier cities in China that pay attention to innovation, but the content of early innovation policies is relatively scattered. The number is relatively small. Until the "innovation driven development strategy" was put forward in 2012, the country attached great importance to innovation development and made an overall plan for innovation. A large number of policies on innovation driven development were introduced successively. Wenzhou also gradually introduced a large number of innovation

policies following the national pace. Therefore, the innovation policies issued between 2012 and 2022 were selected as the policy samples for this study; In order to comprehensively collect the innovation policies issued by Wenzhou City, this study manually screened all policies (including municipal government documents, municipal government office documents, municipal government normative documents, etc.) in the "policy documents" section on the "Wenzhou People's Government Website" (wenzhou.gov.cn), and collected 177 policy texts from 2012 to April

2022, After removing documents with low degree of relevance and duplicate contents, 69 valid documents will be retained.

3. Policy Classification

Based on the classification of the above 69 sub policies, this study classifies them into innovation system construction and industrial development. The specific classification results are shown in Table.1.

Table 1. List of innovation policies in Wenzhou in recent 10 years

Innovation system construction	Industrial development
1.Opinions on Accelerating the Construction and Development of Science and Technology Business Incubators	1.Notice on Printing and Distributing the Work Plan for the Establishment of Demonstration Township (Street) Enterprises for the Implementation of Trademark Strategy
2.Implementation Opinions on Further Strengthening Intellectual Property Protection	2.Implementation Opinions on Accelerating the Development of Modern Equipment Manufacturing Industry
3.Implementation Opinions on Accelerating the Development of Science and Technology Service Industry	3.Implementation Opinions on Further Strengthening Enterprise Technological Transformation and Promoting Machine Replacement
4.Notice on Printing and Distributing the Work Plan of Wenzhou National Intellectual Property Demonstration City	4.Several Opinions on Further Promoting the Development of Modern Logistics Industry
5.Implementation Opinions on Vigorously Promoting the Construction of Wenzhou High tech Industrial Development Zone	5.Implementation Opinions on Promoting the Brand Construction of "Made in Zhejiang"
6.Notice on Printing and Distributing the Layout Planning Scheme of Wenzhou Small and Micro Enterprises Pioneer Park	6.Notice on Printing and Distributing the Implementation Plan for the Cultivation of High growth Industrial Enterprises in Wenzhou
7.Wenzhou Science and Technology Award Measures	7.Notice on Printing and Distributing Wenzhou's Three Year Action Plan for Accelerating the Development of Information Economy (2016-2018)
8.Notice on Printing and Distributing Wenzhou's "Three Year Growth Plan for Small and Micro Enterprises" (2015-2017)	8.Notice on Issuing the Three Year Action Plan for the Development of Wenzhou Modern Logistics Industry (2016-2018)
9.Implementation Opinions on Developing Mass Innovation Space and Promoting Mass Innovation and Entrepreneurship	9.Notice on Implementation of Wenzhou Municipal Government's Industrial Fund Financial Encouragement Policy
10.Notice on Printing and Distributing the Four Special Action Plans of Wenzhou "Three Year Growth Plan for Small and Micro Enterprises"	10.Opinions on the Comprehensive Implementation of the Standardization Strategy
11.Notice on Establishing and Improving the Working System and Mechanism of Wenzhou South Zhejiang Science and Technology City	11.Notice on Printing and Distributing the New "Double Increase" Three Year Action Plan (2018-2020) of Wenzhou Science and Technology Enterprises
12.Notice on Printing and Distributing the 2016 Assessment Method of Wenzhou City's Responsibility System for Supporting Wenzhou Businessmen's Entrepreneurship and Innovation to Promote Wenzhou's Development Goals	12.Notice on Printing and Distributing the Five Year Multiplication Implementation Plan of Wenzhou Digital Economy
13.Notice on Printing and Distributing the Implementation Plan for Wenzhou to Integrate and Establish a Unified Public Resource Trading Platform	13.Implementation Opinions on Financial Services for Real Economy Development
14.Notice on Printing and Distributing the Administrative Measures of Wenzhou Science and Technology Innovation Venture Capital Fund (for Trial Implementation)	14.Notice on Printing and Distributing the Key Points of Wenzhou Digital Economy Catch up Development in 2019
15.Implementation Opinions on New Industrial Land Management of South Zhejiang Science and Technology City (Trial)	15.Notice on Printing and Distributing the Implementation Plan (2021-2023) for the New Round of Wenzhou Manufacturing Industry's "Escape the Cage and Change the Birds, Phoenix Nirvana" Campaign
16.Notice on Printing and Distributing the Work Plan of Wenzhou for a New Round of National Intellectual Property Demonstration Cities (2016-2018)	16.Implementation Opinions on Deeply Promoting the Transformation and Upgrading of Traditional Manufacturing Industry Version 2.0
17.Notice on Printing and Distributing the Three Year Action Plan (2017-2019) for the Construction of Wenzhou Maker Space	17.Notice on Printing and Distributing Wenzhou Software and Information Service Industry Innovation and Development Action Plan (2021-2023)
18.Notice on Establishing the Construction Leading Group and Work Promotion Mechanism of Wenzhou National Independent Innovation Demonstration Zone	18.Notice on Printing and Distributing the Action Plan of Wenzhou for Implementing the Manufacturing Industry Foundation Reconstruction and Industrial Chain Improvement Project
19.Notice on Printing and Distributing the Administrative Measures for the Construction of "One Zone and Multiple Parks" in Wenzhou National High tech Industrial Development Zone (for Trial Implementation)	19.Implementation Opinions on Promoting the High Quality Development of Public Cultural Services
20.Wenzhou's "Fourteenth Five Year Plan" for Science and Technology Development	20.Notice on Printing and Distributing Wenzhou's Action Plan for Promoting the Development of Online New Economy (2020-2022)
21.Notice on Printing and Distributing the Implementation Plan of Technological and Financial Reform and Innovation of Wenzhou National Independent Innovation Demonstration Zone	21.Opinions on Further Accelerating the Development of the "Four New" Economy
22.Notice on Printing and Distributing the Administrative Measures of Wenzhou Science and Technology Innovation Venture Capital Fund	22.Notice on Printing and Distributing the Action Plan for Cultivating and Developing Five Strategic Emerging Industries in Wenzhou (2019-2021)
23.Implementation Opinions on Further Improving the Management of Urban Innovative Industrial Land	23.Notice on Printing and Distributing the Action Plan for the Cultivation of New Business Types of Wenzhou Urban Economy (2019-2021)
24.Notice on Printing and Distributing the Interim Measures for the Open Administration of Public Data Sharing in Wenzhou	24.Notice on Printing and Distributing Ten Policies of Wenzhou City to Promote the Innovative Development of Software and Information Service Industry
25.Notice on Printing and Distributing Several Policies on Promoting the Construction of National Independent Innovation Demonstration Zones with High Quality (for Trial Implementation)	25.Implementation Opinions on Promoting the Reform, Innovation and High Quality Development of Wenzhou's Construction Industry
26.Notice on Printing and Distributing the Interim Measures for the Construction and Management of Wenzhou Public Resources Trading Platform	26.Notice on Printing and Distributing Several Policies and Measures to Promote the Innovative Development of the Biomedical Industry in Wenzhou
27.Notice on Printing and Distributing the Administrative Measures for Special Financial Funds for Wenzhou's Industrial Transformation and Upgrading	27.Several policy suggestions on comprehensively accelerating scientific and technological innovation to promote high-quality development of industrial economy
28.Notice on Printing and Distributing the Administrative Measures of	

<p>Wenzhou Science and Technology Enterprise Incubators</p> <p>29. Notice on Printing and Distributing the Measures of Wenzhou City for the Record Management of Maker Space</p> <p>30. Notice on Printing and Distributing the Rules for the Administration of the Settling Organizations in Wenzhou (Jiading) Science and Technology Innovation Park and the Measures for the Administration of the Settling in of Wenzhou Science and Technology Innovation Public Service Center (Maker's Dream Factory)</p> <p>31. Detailed Rules for the Recognition of Wenzhou Technological Transformation Project Subsidies</p> <p>32. Several policy suggestions on encouraging and supporting financing of scientific and technological enterprises (for trial implementation)</p> <p>33. Notice on Printing and Distributing the Administrative Measures for Scientific Research Projects and Funds in Wenzhou</p> <p>34. Notice on Printing and Distributing the Interim Measures of Wenzhou for the Administration of Scientific Research Integrity</p> <p>35. Notice on Printing and Distributing the Interim Measures for the Administration of Wenzhou Science and Technology Expert Database</p>	<p>28. Several Policy Opinions on Further Accelerating the High Quality Development of Modern Service Industry</p> <p>29. Several Policy Opinions on Accelerating the Development of Digital Economy</p> <p>30. Notice on Several Policy Opinions on Accelerating the Development of Strategic Emerging Industries</p> <p>31. Notice of the Management Committee of Wenzhou South Zhejiang Coastal Advanced Equipment Industry Cluster (Economic Development Zone, Oufei) on Printing and Distributing the Work Points for the Region to Continuously Deepen the Reform of "Heroes per mu" in 2020</p> <p>32. Measures for the Identification of Wenzhou Pilot Enterprises for the Integration of "Two Modernization"</p> <p>33. Policies on Further Supporting Intelligent Transformation of Industrial Enterprises</p> <p>34. The "Fourteenth Five Year Plan" for High Quality Development of Wenzhou's Manufacturing Industry</p>
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4. Statistical Analysis of Subject Words

Read 69 policy documents one by one. On the premise of thorough understanding of the policy content, use the Jieba library in Python to divide the 69 policy documents collected. After removing meaningless words such as "this method", "for", "improve" and so on, count the frequency of the occurrence of each theme word. A total of 194 theme words were obtained. After consulting experts, the theme words with similar meanings were merged, such as "risk sharing" "Risk

prevention and control", etc. are merged into "risk management", etc. Use Donohue's high-low frequency word calculation formula to calculate the word frequency of the subject words, and consider the actual situation of this paper, finally select the subject words with a word frequency greater than 5 as the object of policy text analysis, and obtain 41 high-frequency subject words that basically cover the content of innovation policies related to manufacturing, as shown in Table.2.

Table 2. Frequency data of policy topic words

topic word	frequency	topic word	frequency
intellectual property	557	industrialization	134
small and micro enterprise	281	high-quality economic development	133
share	253	innovation elements	130
innovation and entrepreneurship	230	talent team construction	127
incubator	195	industrial innovation	125
maker space	194	standardization	124
digitization	181	risk management	121
pilot demonstration	179	innovation-driven	119
brand	171	technology service	119
high and new technology	168	Internet	114
research institute	168	colleges and universities	114
innovation center	164	financial policy	113
industrial agglomeration	164	optimum distribution of resources	113
green	162	coordinated development	113
financial policy	162	intelligence	112
public service platform	162	tax policy	111
independent innovation	154	transfer and transformation of scientific and technological achievements	110
informatization	153	intelligent manufacturing	107
new industry	147	innovation bond	90
big data	145	Made in Zhejiang	73
transformation and upgrading	134		

Furthermore, we use Python language to build high-frequency topic word cloud, and get a network diagram that can reflect the complex relationship between different topic words, as shown in Fig.1. The lines in the figure represent whether the subject words appear in the same policy document, the node centrality size (node radius) represents

the number of times the subject words appear, the blue lines and yellow lines in the figure represent the number of times the two subject words appear together, and the yellow lines between the two subject words represent the number of times the two subject words appear together in the same policy document.

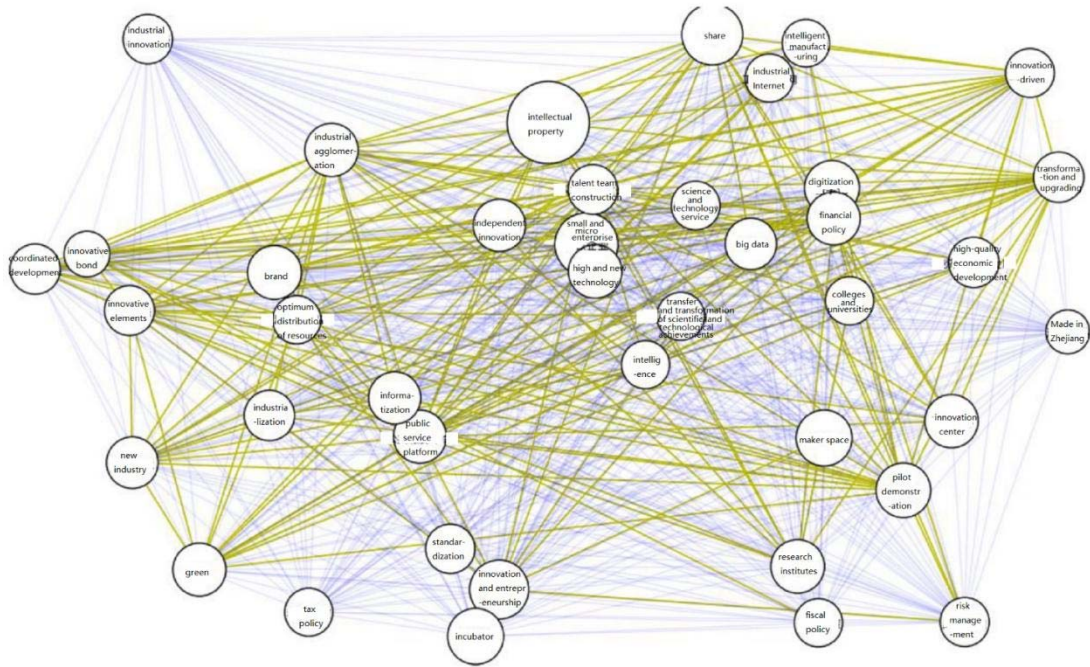


Figure 1. High frequency theme word cloud of innovation policy

5. Conclusions and Suggestions

Wenzhou's innovation policy is mainly deployed for the purpose of promoting Wenzhou's industrial transformation and upgrading and high-quality economic development through innovation, mainly including Zhejiang manufacturing, digitization, intelligence, independent innovation, industrial agglomeration, intellectual property, financial support and other keywords.

Specifically, under the guiding ideology of "government guidance and market leadership", we will carry out macro planning to promote traditional industries to become intelligent, digital, green, and advanced by innovation, vigorously promote the construction and development of science and technology service projects such as innovation centers, provide a good external environment for enterprises to carry out innovation activities, and use financial subsidies, financial support, tax relief and preferences from the micro level Intellectual property protection and other means share the risks of enterprises in the innovation process, stimulate their great vitality as the main body of innovation, and promote their independent innovation ability; At the same time, accelerate the gathering of innovative elements such as capital, talents and technology, guide the accelerated development of strategic emerging industries, and strive to solve the development dilemma of Wenzhou's small and micro enterprises, so as to promote the innovative development of Wenzhou's overall industry from point to area, and inject new vitality into its economic growth.

Nevertheless, Wenzhou's innovation policy design can still be improved from the following four aspects: (1) enrich the nature of the policy and fully release the policy effect. (2) Compulsory, service-oriented, incentive and market-oriented

policy tools are combined to ensure that when voluntary guiding policy tools cannot constrain enterprises, there are still mandatory policy tools to ensure that enterprises stick to the bottom line and do not step on the red line. (3) Enlarge the policy audience and guide all sectors of society to participate in innovation. (4) We will strengthen policy incentives and safeguard measures, and use various means to protect innovation.

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