



# Visual Analysis of the Research Status, Hotspots, and Trends in China's VAT Credit Refunds Using CiteSpace

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**Abstract.** The VAT credit refunds policy has played a vital role in fostering the development of enterprises and ensuring the stabilization of economic operations. Current academic research focus on the impact and future development of policies, but there is a lack of comprehensive and objective analysis in this area. This paper uses CiteSpace bibliometric tool to analyze 246 pieces of literature extracted from the China National Knowledge Infrastructure (CNKI) as the research samples, spanning the period from 2019 to October 2023. A visual analysis is conducted, involving the literature's chronology, authors and institutions, research hotspots, and prevailing research trends. The results show that the research outcomes in the field of VAT credit refunds are relatively rich and the research hotspots can be divided into three major categories. Although there are certain issues at this stage, the future research still has considerable room for development.

**Keywords:** VAT credit refunds; bibliometric analysis; Citespace

## 1 INTRODUCTION

In the report of the 20th Party Congress, General Secretary Xi Jinping emphasized the indispensable role of small and medium enterprises in the establishment of a modern economic system. The enactment of new comprehensive tax support policies, such as the expansive VAT credit refunds policy, represents a significant decision by the Party Central Committee, with Comrade Xi Jinping at the core, strategically responding to both domestic and international dynamics. This initiative aims to fortify cross-cycle and counter-cycle adjustments in addressing the prevailing economic circumstances, thereby providing robust support to enterprises in alleviating challenges and ensuring macroeconomic stability. Consequently, scholars both domestically and internationally have undertaken investigations into the causative factors of tax credits<sup>[1]</sup>, the imperative nature of the policy<sup>[2]</sup>, its impact on enterprise value<sup>[3]</sup>, and other aspects.

However, the existing studies predominantly base on the analysis of specific time nodes during policy implementation, lacking a comprehensive time-series dynamic perspective to explore the policy's effects over an extended period. Methodologically, many studies rely on theoretical interpretations of textual content, with little objective analyses utilizing scientifically measured tools. In light of these considerations, this

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paper uses CiteSpace tool to organize and synthesize the literature on "VAT credit refunds" from the past five years. It distills the research history and current status based on a systematic analysis by using visual mapping and tables. The analysis and discussion of research hotspots and trends further aim to provide a valuable reference for the fundamental research on "VAT credit refunds".

## 1.1 Data Source

The data for this paper emanates from the China National Knowledge Infrastructure (CNKI) database. Utilizing CNKI's sophisticated search functionalities, the search keyword "VAT credit refunds" was employed. All journals within the relevant topics were selected. The time range spans from the official announcement of the VAT credit refunds policy in 2019 to October 2023. This period was chosen to systematically organize, aggregate, and analyze the literature on tax credit rebate. A total of 486 pieces of relevant Chinese literature were retrieved. Following manual curation and screening, which involved the elimination of duplicated literature, experiential exchanges, reviews, activities, notices, and literature with lower relevance to the retrieval topic, 246 pieces of effective literature were obtained.

## 1.2 Research Methods

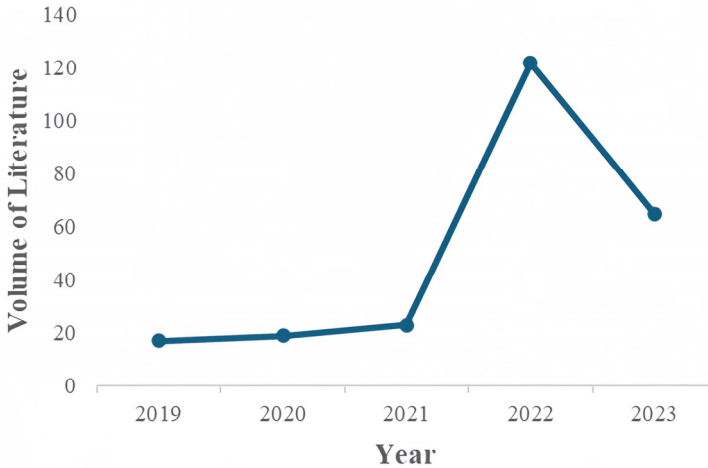
The principal research tool used in this paper is the CiteSpace software, devised by Dr. Chaomei Chen of Drexel University, USA. Using this sophisticated information visualization tool, the research literature concerning the "VAT credit refunds" topic is visually measured and analyzed, considering dimensions such as authors, institutions, keyword co-occurrence, and others. Based on these analyses, the paper engages in a discourse on the present research status, hotspots, and frontiers within the domain of VAT credit refunds policy.

# 2 DATA ANALYSIS AND RESULTS DESCRIPTION

## 2.1 Chronological Analysis of the Literature

The number of articles published in a certain time period reveals the development characteristics of the field. A total of 246 pieces of literature were retrieved, and the trend of the core research on VAT credit refunds policy from 2019 to 2023 can be deduced by graphing the annual article count curve (Fig.1). Based on the trend of the curve, the core research on this policy can be roughly divided into three stages: the starting stage (2019-2021), the rapid growth stage (2021-2022), and the temporary decline stage (2022-2023). From the perspective of publications, in the starting stage, the number of publications increases slowly and the base is small, indicating that the policy has not been widely concerned by the core research community. In 2021, affected by the top-level orientation and economic environment, publications demonstrate a marked surge, indicating heightened scholarly interest in the VAT credit refunds policy. In 2022, a

certain regression is observed. Overall, the fluctuations in research activity are characterized as both cyclicity and progressivity, with an general trend that advances despite the cyclical undulations.



**Fig. 1.** Number of articles published in CNKI database from 2019 to 2023

## 2.2 Author Cooperation Analysis

Through a quantitative examination of the authors within the sample literatures, we can not only derive the authoritative scholars in the field but also measure the collaborative relationships among them. Based on the analyzed data about the authors presented in CiteSpace, the information of the top 8 prolific authors was extracted and organized into Table 1 to derive the results. Among them, Li Mingtai, Liu Yi, Jin Zhen have published a great number of articles and most authors other than these 8 have contributed 1-2 articles, shaping a collaborative network structure centered around these core authors. This formation indicates a robust team-building effort. The domestic research on VAT credit refunds policy reveals a multi-core development pattern, with a distinct core author group having been established. A few core members occupy vital positions, playing a crucial role in this scholarly landscape.

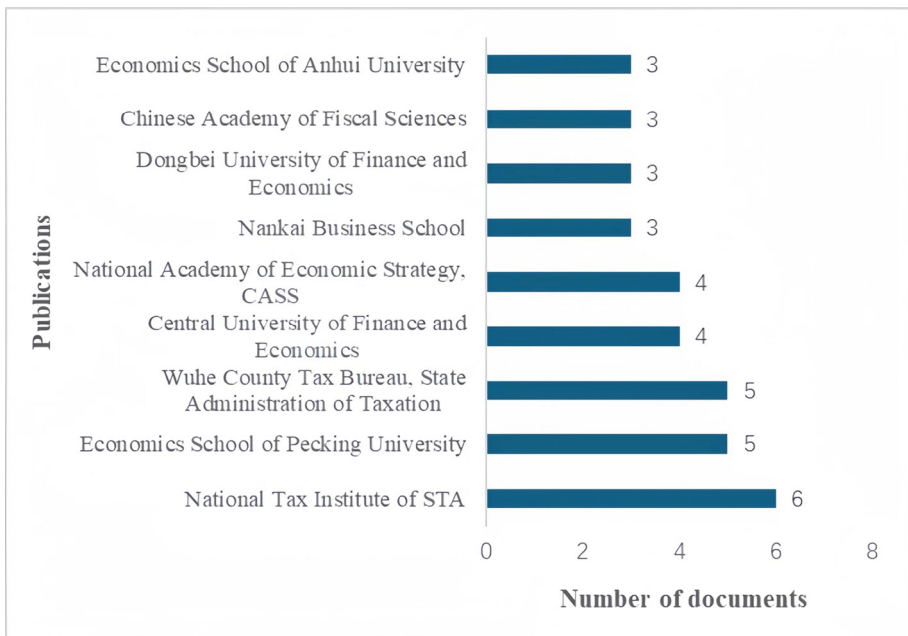
**Table 1.** Top 8 authors

Author	Year of initial publication	Number of papers
<b>Li Mingtai</b>	2019	5
<b>Liu Yi</b>	2020	4
<b>Jin Zhen</b>	2022	4
<b>Li Xuhong</b>	2020	4
<b>Xie Yanxiang</b>	2022	4

<b>Wang Wenqing</b>	2019	3
<b>Liao Yonghong</b>	2019	3
<b>Cui Huiyu</b>	2020	3

### 2.3 Institution and Collaborative Network Analysis

To provide a clear depiction of the key research institutions, Figure 2 has been generated using relevant data from CiteSpace. It lists the top 9 institutions with a substantial number of publications. In the field of VAT credit refunds research, research institutes and colleges have more fruitful scientific research results, among which the National Tax Institute of STA stands out as the most prolific publisher of papers. This is attributed to its specialized expertise and research focus on tax policy and related fields. Simultaneously, this institution may have close ties with government tax agencies, making it easier for it to obtain policy information and practical experience, which is crucial for deep research on tax credit policy.



**Fig. 2.** Visualization of the collaborative network among institutions in VAT credit refunds

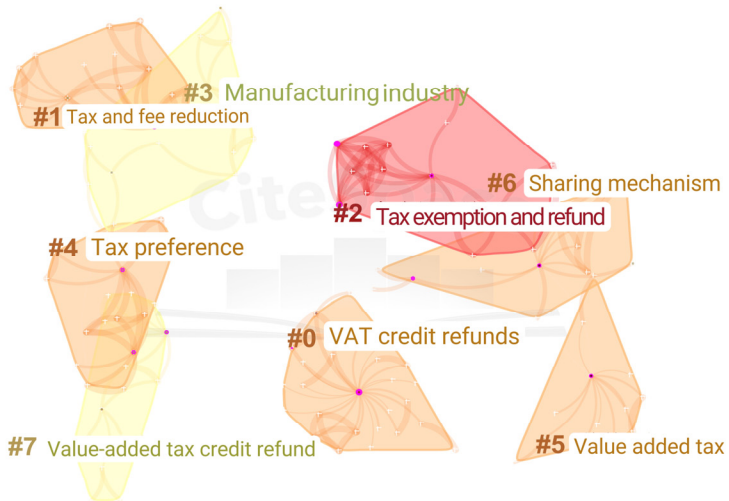
### 2.4 Keyword Clustering and Research Hotspot Analysis

Clustering mapping aims to depict the structural characteristics among clusters, emphasizing pivotal nodes and significant connections. The module value (Q value) and the average profile value (S value) are two key indicators in clustering mapping. The  $Q > 0.3$  signifies a noteworthy cluster structure, while  $S > 0.5$  indicates the rationale behind the

clustering. In Figure 3, the obtained Q value is 0.8185, and the S value is 0.9503, affirming the significance of the keyword clustering structure and the credibility of the clustering results. Given the extensive number of clusters in the initial mapping, the focus was narrowed to the eight largest clusters for a lucid presentation of robust clustering outcomes. Through a synthesis of keyword clustering mapping, the research hotspots in China's VAT credit refunds over the past five years predominantly concentrate on the following three aspects.

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Timespan: 2019-2023 (Slice Length=1)
Selection Criteria: g-index (k=25), LRF=3.0, LBY=5, e=1.0
Network: N=206, E=630 (Density=0.0298)
Largest CC: 190 (92%)
Nodes Labeled: 1.0%
Pruning: Pathfinder
Harmonic Mean(Q, S)=0
  
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**Fig. 3.** Cluster Network Map of Key Keywords in VAT credit refunds

### (1) Theoretical Research on VAT Credit Refunds Policy

By systematizing the relevant theories associated with VAT credit refunds policies and formulating a suitable theoretical framework, it facilitates a profound comprehension of the intrinsic logic and target orientation of the policy. Moreover, it furnishes theoretical support and guidance for subsequent research into the policy's implementation mechanisms and its effects. Teng Wenbiao believes that the theoretical basis of tax lien refund comes from the taxpayer's right to tax lien refund, and the right to tax lien refund is the core of the tax lien refund system. However, the right to tax lien refund needs to be subjected to the constraints of the real conditions<sup>[4]</sup>. From the perspective of public governance, Wang Nong and others contend that the rule of law in taxation serves as the fundamental principle governing the orderly operation of policies, and intelligent taxation constitutes a crucial bedrock for the effective functioning of policies<sup>[5]</sup>.

## **(2) The Impact and Implications of VAT Credit Refunds Policy.**

The VAT credit refunds policy has played a vital role in relieving enterprises' challenges and facilitating their development. Many scholars have conducted comprehensive investigations into the multifaceted effects of policy implementation from diverse perspectives. Concerning the policy's impact on enterprise capital flow, Liu Jinke and Deng Minghuan used the Differences-in-Differences model and discovered that the policy stimulates investment activities within enterprises, effectively increasing their cash flow<sup>[6]</sup>. The majority of studies indicate that the policy has the capacity to reduce both production and operation costs as well as research and development expenditures for enterprises, thereby incentivizing innovation<sup>[7]</sup>.

## **(3) Mechanism Design and Administration of VAT Credit Refunds Policy.**

The core of ensuring a seamless and effective promotion of the policy lies in its mechanism design. The VAT credit refunds system also relates to the fiscal system of inter-governmental income distribution. Nie Haifeng and Liu Yi then proposed to adjust the regional allocation proportion of VAT credit refunds and mitigate the impact of tax rebate distribution on regional tax burden outputs<sup>[8]</sup>. In addition, it has imposed higher demands on tax administration while the implementation of the policy has stabilized market participants. With the frequent occurrence of tax fraud and tax evasion cases of tax credits, enhancing the existing credit evaluation system and establishing a risk prevention mechanism characterized by "pre-screening beforehand, auditing in the middle of the process, and sampling after the fact"<sup>[9] [10]</sup> demand attention and refinement in the management of policy implementation nowadays.

# **3 CONCLUSIONS AND FUTURE PROSPECTS**

## **3.1 Research Conclusions**

Based on the analysis of CiteSpace visualization function, this paper conducts econometric analysis on the research in the field of VAT credit refunds in China. It draws corresponding knowledge maps and tables, leading to the following conclusions:

Firstly, in terms of the volume of studies, there are fewer studies in the field of VAT credit refunds. The highest annual article issuance is approximately 120, portraying a developmental trend characterized by "starting - rapid expansion - temporary decline." Secondly, regarding the current state of research, there exists a certain cooperation and exchange among diverse scholars and institutions. A cooperative network emerges, with core authors and authoritative institutions at its center, fostering a relatively stable core group of authors and institutional collaboration. Lastly, concerning research hotspots and evolutionary trends, the exploration within the VAT credit refunds domain has shifted gradually from the focus on policy itself to an exploration of the policy's impact on enterprise development. The issues of paramount concern in each period show distinct timeliness.

### 3.2 Future Prospects

The VAT credit refunds policy has not only stimulated market vitality and fostered confidence in social and economic development, but also robustly stabilized the macroeconomic market. As an enduring policy mechanism, the realm of VAT credit refunds still has considerable potential for further development. Subsequent research endeavors should strategically concentrate on the following three dimensions:

Firstly, it's urgent to bolster the scholarly exchanges in the field of VAT credit refunds. Research is mainly concentrated within the economic and financial professions currently. The research content shows notable similarity and the research field remains relatively narrow. Therefore, it's paramount to break the academic barriers and foster interdisciplinary research. This approach aims to cultivate a collaborative team that operates across specialties and regions, facilitating profound cooperation.

Secondly, it's necessary to align with the prevailing themes in the realm of VAT credit refunds. Given the evolving economic climate, the policy design of VAT credit refunds has also changed. While the historical focus included "VAT amount" "tax incentives" and the "manufacturing industry", the future research should keep pace with the times. This means integrating more empirical research as well as directing attention towards the mechanism design and risk prevention of the policy in its later implementation stages.

Finally, it's significant to innovative research methods in the field of VAT credit refunds. Existing research predominantly operates at the theoretical level, mainly summarizing experiences and analyzing theories. Quantitative studies emerge sometimes but often centered on Differences-in-Differences model, with the selected theoretical models are highly homogeneous. There is a necessity to propel methodological innovation and combine qualitative and quantitative approaches. It's also important to diversify data sources and improve the consistency and reliability of the research.

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