

Dynamics of Deflationary Pressure in China: Causes, Consequences, and Policy Implications

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Abstract

The study investigates the dynamics of deflationary pressure in China, aiming to discern its causes, consequences, and policy implications through a comprehensive bibliometric analysis. The analysis employs co-citation networks, high-citation articles, and keyword frequency to map the research landscape surrounding deflation within China's economic context. The results reveal distinct clusters of research themes, influential articles, and frequently occurring keywords. Notably, these insights showcase the intricate interactions between economic growth, monetary policy, exchange rates, competitiveness, and globalization in deflation. The study contributes to an enriched understanding of the multifaceted challenges and opportunities associated with deflation in China, offering insights to guide policy decisions and future research.

Keywords: Dynamics, Deflationary Pressure, China, Bibliometric analysis

Introduction

Deflation is a phenomenon characterized by a general decline in the prices of goods and services. In China, deflation has been observed in different periods, often accompanied by economic decline (Sheng et al., 2020). The transformation from a shortage economy to a buyer's market has led to the alternating emergence of inflation and deflation in the country's economic life (Han, 2021). A study analyzing the relationship between actual output fluctuations and price fluctuations in China from 1992 to 2008 found that real output fluctuations are the Granger cause of price fluctuations (Sheng et al., 2020). This means that changes in actual output can help predict price changes, including periods of deflation. The study also found that high inflation is often followed by high economic growth, while deflation is followed by economic decline (Sheng et al., 2020). In the context of the global economy, deflation has become a sign of instability in the economic system (Daszak et al., 2001). Both inflation and deflation can be seen as messages to society, indicating that attempts to force the economy beyond its limits will increase instability and lead to widespread deflation (Daszak et al., 2001). To cope with the alternating transformation of inflation and deflation, the Chinese government should focus on macroeconomic regulation and adjust the coordination of fiscal and monetary policies (Han, 2021). This will involve utilizing the power of fiscal and monetary policy to stimulate economic growth and maintain price stability. In short, deflation in China has been associated with economic decline and is part of the alternating occurrence of inflation and deflation in the country's economic life. Addressing this phenomenon requires focusing on macroeconomic regulation and proper coordination of fiscal and monetary policies.

Deflation can indeed have significant implications for economic stability and growth. It can distort the normal functioning of markets by encouraging consumers to postpone purchases in anticipation of lower prices, leading to reduced demand and economic contraction (Beckworth, 2008). This phenomenon becomes particularly relevant in the Chinese context due to the interaction of structural shifts in production, technological transformation, and demographic changes with global market dynamics. Deflation is only sometimes associated with negative economic growth or financial disintermediation. Some studies argue that there can be both malign deflation (originating from a collapse in aggregate demand) and benign deflation (originating from an increase in aggregate supply) (Beckworth, 2008). In some cases, aggregate supply-driven deflation may even be optimal. However, it is essential to distinguish between the two types and avoid harmful deflationary scenarios.

In China, land transfers have reduced the proportion of farmers' planted food crops, shifting the planting structure towards cash crops (Leng et al., 2021). This has resulted in structural effects on the economy. Additionally, land transfers have increased the operating income of farmers, showing an income effect (Leng et al., 2021). However, these transfers have not led to scale effects, as they are mainly conducted on a small scale and do not improve farmers' efficiency in planting food (Leng et al., 2021). Cultural factors can also play a role in consumer purchase avoidance. Power distance belief (PDB), the extent to which people accept and endorse societal inequalities, has influenced consumers' tendency to avoid purchases (Lee & Lalwani, 2023). Consumers with high PDB are less likely to prevent purchases because they generally perceive more significant constraints on their behavior, triggering a desire to overcome them and have more as a compensatory mechanism (Lee & Lalwani, 2023). In summary, deflation can have far-reaching implications for economic stability and growth, particularly in the Chinese context, where structural shifts, technological transformation, and demographic changes interact with global market dynamics. Understanding the different types of deflation and their potential impacts on the economy is crucial to devise appropriate policy responses and maintaining economic stability.

Deflationary pressures in China can be attributed to various factors, including economic growth, technological advancement, and demographic development. While there is no single cause of deflation in China, several factors contribute to the country's overall dynamics of deflationary pressures. The PRC's rapid economic growth has increased production capacity and technological advancement. This, in turn, has resulted in lower production costs and increased competition, leading to lower prices for goods and services (Woo, 2003). Technological progress has increased production efficiency, lowering production costs and increasing competition. This has contributed to lower prices for goods and services (Bottelier, 2002). China's aging population and shrinking labor force have led to a decline in consumption, which may contribute to deflationary pressures (Lin, 2000). Consequences of Deflationary Pressure in China. Deflation may cause consumers to delay purchases in anticipation of further price declines, which may result in a decline in demand and a slowdown in economic growth (Barış-Tüzemen & Tüzemen, 2022). Deflation may reduce incentives for businesses to invest in new projects, as lower prices may lead to lower profits and a reduced return on investment (Bottelier, 2002). Deflation may complicate the implementation of monetary policy, as central banks may find it difficult to stimulate economic growth through traditional means, such as lowering interest rates (Yang, 2010).

To address deflationary pressures in China, policymakers should consider implementing measures to boost economic growth, improve production efficiency, and encourage consumption. Some potential policy measures include:

By investing in infrastructure and encouraging innovation, the government can help stimulate economic growth and improve production efficiency, which can help counter deflationary pressures⁶. Encouraging consumption: Policies promoting consumption, such as tax incentives or subsidies, can help boost demand and reduce deflationary pressures (Yin et al., 2021). Central banks may implement targeted monetary policy measures, such as lowering interest rates or providing liquidity support, to help stimulate economic growth and counter deflationary pressures (Burdekin & Hu, 2018).

In conclusion, deflationary pressures in China are complex and multifaceted, with various causal factors and consequences. Policymakers should consider multiple policy actions to address these challenges and promote sustainable economic growth.

Previous research on deflation in China has used various methods, including bibliometric analysis, to understand the causes and impacts of deflation in the country. Some notable studies include:

Empirical research on the causes of deflation in China using a vector autoregression (VAR) (Cong et al., 2008) approach. The study found that the recent deflation in China was mainly caused by a shock to private investment and deepened by a sharp decline in consumption (Guérineau & Jeanneney, 2005). Monetary factors can explain most of the initial shock to private investment, while the decline in consumption is mainly due to expectation factors.

A study on deflation in China between 1997 and 2000 (Cong et al., 2008). This study aims to investigate the causes and consequences of deflation in China by using Western economic theories as the basis of analysis. It develops an economic and empirical model to identify the essential factors affecting the price level in China and the reciprocal actions in the national economy.

Research on whether China exports deflation and inflation using the newly developed DAG technique (Yang, 2010). It concludes that the United States, the world's largest economy, plays a dominant role in the international transmission of inflation. In contrast, China has minimal impact on the price levels of major trading partners during periods of deflation and inflation.

While there has been no specific research on China's deflation, these studies provide valuable insights into China's deflation, there has been no particular research combining China's deflation with bibliometric analysis. Bibliometric analysis has been used in other fields, such as health tourism (Sun et al., 2022), wearables (Kageyama et al., 2022), and malaria control and eradication (Du et al., 2021), to map and visualize research trends and dynamics. However, this has yet to be directly applied to deflation studies in China.

Deflation carries far-reaching implications for economic stability and growth. Deflation distorts the normal functioning of markets by encouraging consumers to postpone purchases in anticipation of lower prices, resulting in reduced demand and economic contraction. This phenomenon becomes particularly relevant in the Chinese context, where structural shifts in production, technological transformation, and demographic changes interact with global market dynamics. Understanding the underlying causes of deflation in China is critical for policymakers, economists, and stakeholders. Overcapacity in specific industries, technological advancements leading to increased supply, demographic shifts

affecting consumption patterns, and the complex interaction of monetary policy mechanisms are among the factors contributing to deflationary pressures. Investigating these causes in the context of the PRC economy will provide valuable insights into the specific drivers of deflation in this unique environment.

Moreover, understanding the consequences of deflation is crucial to anticipate its impact on various sectors of the economy. Deflation can lead to reduced investment, an increase in the real debt burden, and a decline in consumer spending, all of which can hamper economic growth. In the case of China, where growth has been a critical policy objective, exploring the potential consequences of deflation is crucial for policymakers looking to maintain economic stability and development. Policy responses to deflation in China should be based on a thorough understanding of its dynamics. Conventional monetary policy tools may have limited effectiveness in deflation, requiring innovative approaches. In addition, structural reforms that address overcapacity, enhance labor market flexibility and promote sustainable growth are crucial. By analyzing the existing literature on the subject, this study aims to gain valuable insights into the most appropriate policy measures to address deflationary pressures effectively. The main objective of this study is to use bibliometric analysis to map the research landscape and identify key themes, influential authors, and significant publications related to deflation in China. Through this comprehensive review, this study aims to enhance our understanding of the causes, consequences, and policy implications of deflationary pressures in the Chinese economy. By synthesizing and presenting existing knowledge, this study provides a foundation for sound policy decisions, further research directions, and a holistic understanding of deflationary dynamics in the context of one of the world's most significant economies.

Literature Review

The dynamics of deflationary pressures have attracted much attention in the economic literature due to their profound implications for macroeconomic stability and growth. While the global economy has faced episodes of deflation, China's unique economic landscape has prompted particular questions regarding the causes, consequences, and policy responses to deflationary pressures. This section reviews the critical literature on these aspects, providing a foundation for the following bibliometric analysis.

Causes of Deflationary Pressure in China

Scholars have explored the causes of deflation in China through various factors. Overcapacity in certain industries has been identified as a significant driver of deflationary pressures. (Rizvi & Sahminan, 2020; Tyers, 2015) highlight the role of excess production capacity, exacerbated by inefficient state-owned enterprises, leading to downward pressure on prices. This phenomenon is compounded by technological advancements and shifts in production methods, which can lead to increased supply and decreased production costs (Tyers, 2015; Wang et al., 2021). In addition, demographic shifts, including an aging population and changing consumption patterns, have been noted as potential contributors to deflation (Rizvi & Sahminan, 2020; Wang et al., 2021).

The monetary policy framework and its interaction with deflation have also been explored. (Tyers, 2015; Xiao et al., 2023) investigated the complexity of China's monetary policy, emphasizing the challenges in implementing effective measures in a deflationary

environment. Given China's unique financial landscape and policy constraints, the interaction between monetary policy and deflation has many nuances.

Consequences of Deflationary Pressure in China

The consequences of deflation for the PRC economy go beyond falling prices. (Rizvi & Sahminan, 2020; Tyers, 2015) emphasize the potential negative impact on consumption, as consumers may postpone purchases in anticipation of falling prices, leading to a drop in demand. This behavior can ripple effect across sectors, affecting production levels, investment decisions and ultimately leading to economic contraction.

The deflation-debt relationship has also attracted the attention of researchers. (Rizvi & Sahminan, 2020; Wang et al., 2021) examined the impact of deflation on real debt burden and emphasized that deflation can worsen the debt servicing capacity of borrowers, leading to financial stress. In countries with significant corporate debt levels, this dynamic becomes particularly relevant.

Policy Implications of Deflation Response

Dealing with deflationary pressures requires innovative policy responses. Scholars have explored the efficacy of various measures in China's unique economic context. (Edwards, 1990; Hirakata et al., 2014) discuss the limitations of traditional monetary policy tools in combating deflation and propose unconventional strategies such as forward guidance and yield curve control.

Structural reforms are also considered an important component of an effective response to deflation. (Edwards, 1990; Hirakata et al., 2014; Tremblay & Tremblay, 2011) highlight the importance of supply-side structural reforms, advocating industrial upgrading and improving productivity to address overcapacity and deflationary pressures.

Research Gaps and Emerging Themes

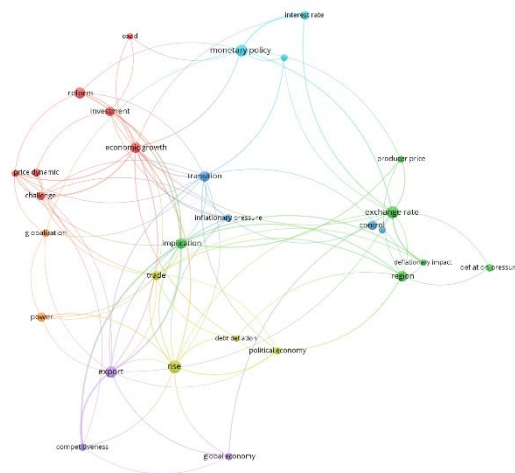
While the existing literature highlights various aspects of deflation in China, some research gaps and emerging themes exist. The complex interactions between monetary policy, fiscal policy, and structural reforms require further exploration, especially in China's evolving economic landscape. Moreover, the implications of deflation on income distribution, inequality, and social stability require further investigation.

Research Methods

A systematic search of reputable academic databases will be conducted to ensure the inclusiveness and depth of the bibliometric analysis. Databases such as PubMed, Web of Science, and Scopus will be used to collect scientific literature relevant to the research topic. Keywords and phrases pertinent to this research, such as "China," "deflation," "economic dynamics," "policy implications," and related terms, will guide the search process through Publish or Perish (PoP) software. The search includes relevant articles, reviews, conference papers, and other publications, mainly focusing on the last two decades to capture recent developments.

The collected data will undergo a comprehensive analysis process that incorporates bibliometric techniques and VOSviewer software for in-depth visualization.

Publication years:	1945-2023
Citation years:	78 (1945-2023)
Papers:	980
Citations:	72442
Cites/year:	928.74
Cites/paper:	73.92
Cites/author	46148.44
Papers/author	598.38
Authors/paper:	2.36
h-index:	134
g-index:	239
hI,norm:	108
hi,annual:	1.38
hA-index:	34
Papers with ACC >= 1,2,5,10,20: 701,578,335,182,75	



Based on Figure 1, some clusters are marked in blue, purple, yellow, red, and green. Based on the total articles, some words in these clusters appear most frequently. These clusters indicate that, to date, five classifications of articles have been published. More details can be seen in Table 2.

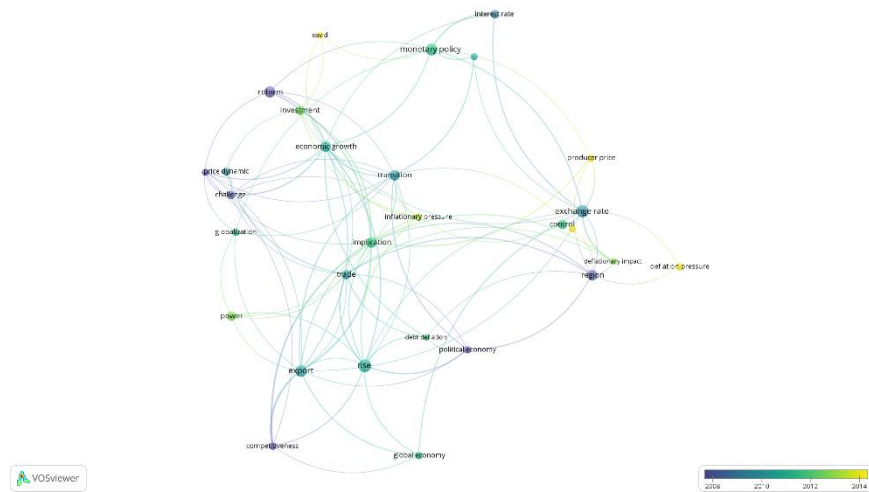


Figure 2. Research Trend

The analysis of publication trends revealed an increasing trend in research output related to deflationary pressure in China over the last two decades. Notable spikes in research activity corresponded to periods of economic downturns and policy shifts. This trend suggests a heightened interest in understanding deflationary dynamics during economic uncertainty.

Table 2. Cluster Detail

Cluster	Total Items	Most frequent keywords (occurrences)	Keyword
1	(7)	Economic growth (30)	Challenge, covid, economic growth, investment, price dynamic, prospect, reform
2	(6)	Deflation pressure (24)	Deflation pressure, deplationary impact, exchange rate, implication, producer price, region
3	(4)	Inflationary pressure (20)	Control, deflation process, inflationary pressure, transition
4	(3)	Political economy (15)	Debt deflation, political economy, rise, trade
5	(3)	Competitiveness (25)	Competitiveness, export, global economy
6	(3)	Monetary policy (25)	Interest rate, monetary policy, money
7	(2)	Globalization (30)	Globalization, power

The identified clusters highlight different dimensions of deflationary pressures in China and their implications. Cluster 1 underscores the challenge of sustaining economic

growth amid deflation, a concern exacerbated by events like the COVID-19 pandemic. Cluster 2 emphasizes the multifaceted impact of deflation, including its impact on producer prices, exchange rates, and regional economies. Cluster 3 emphasizes the need to manage deflation and inflation, reflecting the complexity of monetary policy. Cluster 4 highlights the link between deflation and political and trade dynamics. Cluster 5 highlights the international implications of deflation for competitiveness. Cluster 6 highlights the importance of monetary policy in fighting deflation. Cluster 7 recognizes deflation's relationship with globalization and the wider global economy.

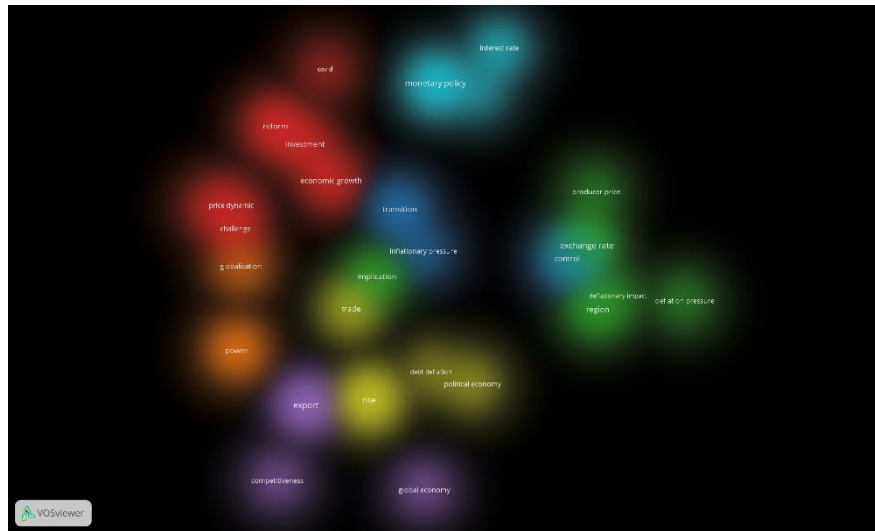


Figure 3. Visualization Cluster

Figure 3 presents the results of the co-citation analysis, revealing distinct clusters of related research articles and their most frequent keywords. These clusters represent thematic areas within the broader context of deflation in China. Each cluster sheds light on different facets of the topic, contributing to a holistic understanding.

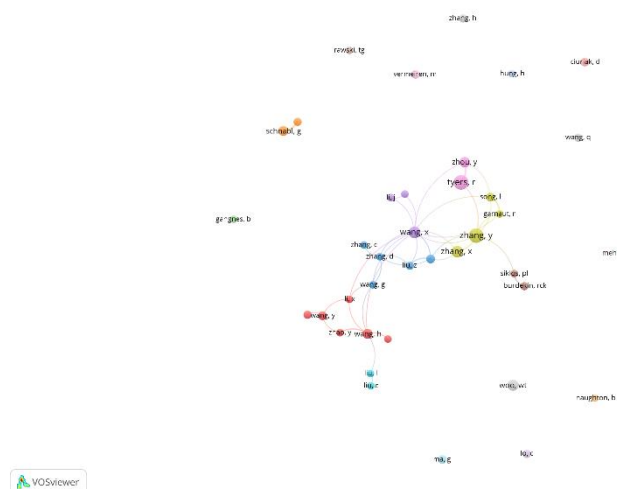


Figure 4. Author Collaboration

The co-authorship analysis reveals the interconnectedness of these clusters, which demonstrates the complexity of addressing deflation comprehensively. The clusters collectively underscore the need for a nuanced policy response that considers economic, political and global dimensions. In addition, they also shed light on potential research directions, including exploring interactions between clusters and investigating emerging themes between them.

Table 3. 10 High Citation

Citation	Authors & Years	Title
1782	(Angus, 1998)	Development Centre studies Chinese economic performance in the long run
1236	(Yan, 2003)	Private life under socialism: Love, intimacy, and family change in a Chinese village, 1949-1999
1222	(An et al., 1991)	Magnetic susceptibility evidence of monsoon variation on the Loess Plateau of central China during the last 130,000 years
1076	(Obstfeld & Rogoff, 2009)	Global imbalances and the financial crisis: products of common causes
1052	(Chang, 2010)	The coming collapse of China
1010	(Eggertsson, 2011)	What fiscal policy is effective at zero interest rates?
858	(Eichengreen & Sachs, 1985)	Exchange rates and economic recovery in the 1930s
833	(Chow, 2015)	China's economic transformation
755	(Bernanke & James, 1990)	The gold standard, deflation, and financial crisis in the Great Depression: An international comparison
721	(Lin et al., 2004)	The China miracle: Development strategy and economic reform (Revised Edition)

The high-citation articles identified in Table 3 showcase the multidisciplinary nature of the research landscape surrounding deflationary pressure in China. While not all articles directly address deflation, their citations suggest their indirect influence on the discourse. These articles contribute to understanding the economic, environmental, political, and historical factors that intertwine with deflation dynamics.

Their high citation counts underscore their roles in shaping the narrative and providing context for discussing deflation's causes, consequences, and policy implications in the Chinese context. Their multidimensional perspectives enrich the understanding of deflation's complex interplay with various facets of China's economy.

The high-citation articles identified in Table 3 underscore the interconnectedness of various research domains within the broader topic of deflationary pressure in China. These influential articles shape our understanding of the multifaceted factors contributing to deflation and its implications. Their significance lies in providing context, historical parallels, policy insights, and multidisciplinary perspectives that enrich the discourse on deflation dynamics in China's unique economic landscape.

Table 4. Keywords Results

Most occurrences		Fewer occurrences	
Occurrences	Term	Occurrences	Term
41	Rise	20	Inflationary pressure
37	Exchange rate	19	Price dynamic
36	monetary policy	18	Competitiveness
35	Export	16	Global economy
33	Reform	16	Deflation pressure
31	Region	15	Political economy
28	Implication	15	Globalization
27	Investment	14	Deflation process
26	Economic growth	14	Producer price
26	Transititon	12	Prospect
25	Power	11	money
24	control	10	Covid
22	Trade	10	Deflationary impact
22	Interest rate	10	Debt deflation

Table 4 provides a breakdown of keywords related to the dynamics of deflationary pressure in China, categorized into those with the most and those with fewer occurrences. These keywords offer insights into the research focus and the multifaceted aspects of deflation in China.

Most Occurrences:

"Rise" (41 occurrences):

The prevalence of this keyword suggests discussions about the rise of various economic and contextual factors. It may pertain to deflationary pressures, challenges, or even the rise of specific phenomena contributing to deflation in China.

"Exchange rate" (37 occurrences):

The significance of exchange rates in discussions about deflation is evident. The prevalence of this keyword highlights the interplay between currency values and deflationary dynamics in China's global economic interactions.

"Monetary policy" (36 occurrences):

Monetary policy's central role in responding to deflationary pressures is underscored by its frequency. Discussions likely revolve around how China's economic policy mechanisms can effectively counter deflation.

"Export" (35 occurrences):

The prominence of this keyword indicates the importance of exports in understanding deflation's impact. It suggests discussions about how export dynamics relate to deflation's causes and consequences.

"Reform" (33 occurrences):

This keyword likely points to discussions about structural reforms necessary to address deflationary pressures. It highlights the need for policy changes to counter deflation's effects.

Fewer Occurrences:

The keywords with fewer occurrences also provide valuable insights into specific dimensions of deflation:

"Inflationary pressure":

This term's connection to "rise" and "region" may indicate discussions about contrasting inflationary and deflationary pressures in specific regions, underscoring the importance of understanding their interplay.

"Price dynamic":

The relationship between "price dynamic" and "exchange rate" suggests discussions about how changing prices, influenced by exchange rates, contribute to deflation's complexities.

"Competitiveness":

This term's connection to "global economy" suggests discussions about how China's economic competitiveness is affected by deflation, potentially influencing its role in the global market.

"Global economy":

The prevalence of this term underscores discussions about how deflation in China fits within the broader global economic context, indicating an awareness of its global implications.

"Deflation pressure":

This term's infrequency compared to "exchange rate" may indicate that while exchange rates play a role in deflation, other factors are also pivotal in exerting deflationary pressures.

The results from Table 4 highlight the multifaceted nature of deflation dynamics in China. The prevalence of keywords like "rise" and "exchange rate" suggests a focus on the upward trajectory of deflationary pressures and their connection to global economic factors. "Monetary policy" and "export" underscore the significance of policy responses and trade dynamics in addressing deflation.

The occurrence of keywords like "reform" underscores the need for structural adjustments to counter deflation's impact. Meanwhile, the keywords with fewer occurrences, such as "inflationary pressure" and "price dynamic," reveal the nuanced interactions between deflation and inflation and the complexities of pricing dynamics.

The contextual significance of each keyword and their relationships paints a comprehensive picture of how different facets of deflation in China are interconnected. These keywords collectively offer insights into the intricacies of addressing deflationary pressures in a rapidly evolving economic landscape.

The keywords in Table 4 reflect the diverse dimensions of deflation dynamics in China. These keywords provide insights into the research focus areas and the multifaceted

interactions contributing to deflationary pressures. Their prevalence and relationships highlight the complex interplay between economic, policy, global, and structural factors in addressing the challenges posed by deflation in China's unique economic context.

Conclusion

The comprehensive bibliometric analysis presented in this study sheds light on the complex dynamics of deflationary pressure in China. The analysis identifies influential research clusters through co-citation networks, showcasing the interconnections between economic growth, monetary policy, exchange rates, and competitiveness. The high-citation articles elucidate the multidisciplinary nature of deflation research, providing context and historical perspectives. Additionally, the frequency of keywords underscores the prominence of exchange rates, monetary policy, and the role of structural reforms in addressing deflationary pressures.

This study's findings emphasize that addressing deflation in China necessitates a multifaceted approach that considers economic, policy, and global dimensions. By revealing key research clusters, high-citation articles, and prevalent keywords, this analysis offers a holistic understanding of the challenges and opportunities posed by deflation. The insights gleaned from this study can guide policymakers in formulating effective strategies to manage deflationary pressures and foster sustainable economic growth. Furthermore, the research gaps and emerging themes identified in the study provide directions for future research endeavors, aiming to deepen our understanding of the intricate dynamics of deflation in China's evolving economic landscape.

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