

The Impact of Financial Structure Optimization on Industrial Upgrading and Economic Development under the Northeast Revitalization Strategy

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Abstract. Northeast China plays a significant strategic role in the country's overall development, particularly as a traditional heavy industrial base that has had a profound impact on the national economy. Since the revitalization strategy for this old industrial base was launched in 2003, the region's comprehensive economic strength has steadily improved, with gradual optimization of its economic structure. However, despite progress in the financial sector, challenges such as inefficient resource allocation and insufficient support for industrial innovation remain. This paper aims to study and highlight the positive role of financial structure optimization in promoting industrial upgrading. By conducting an in-depth analysis of the region's industrial upgrading paths and the characteristics of its financial structure, the paper explores how optimizing financial structures can effectively drive industrial transformation and upgrading. Ultimately, the paper seeks to establish a systematic theoretical framework that provides a foundation for future research and offers theoretical guidance and references for practical applications in Northeast China's economic development and industrial policy reforms.

Keywords: Revitalization of Northeast China, financial structure, industrial upgrading.

1. Introduction

Financial development significantly impacts economic growth. To fully leverage the financial structure's potential in advancing the real economy and enhancing industrial structure, it must be integrated with the real economy's industrial framework. Northeast China, a key industrial and agricultural base, plays a vital role in national defense, food security, ecological security, energy security, and industrial security. Its development is crucial to the country's overall progress, making the revitalization of Northeast China essential. The Party Central and the government have consistently emphasized this region's development. In 2003, former Premier Wen introduced the "the "Northeast Revitalization Strategy" during visits to Heilongjiang and Jilin provinces. This was followed in 2016 by the issuance of the "Several Opinions on the Comprehensive Revitalization of Northeast China and Other Former Industrial Bases from the CPC Central Committee and the State Council," which aimed to further advance the revitalization strategy. In 2021, the "Comprehensive Revitalization of Northeast China: 14th Five-Year Plan" was reviewed and approved, outlining objectives to enhance the region's capacity to maintain the "five major securities," establish a regionally complementary and high-quality economic layout, and achieve breakthroughs in revitalization efforts. This paper seeks to analyze the mechanisms, pathways, and impacts of financial structure optimization on industrial upgrading, aligning this analysis with the strategy for revitalizing Northeast China, and providing guidance for further research and practical applications in addressing the region's development challenges.

2. Current Status and Upgrading of Industrial Structure in Northeast China

2.1. Section Headings Process and Principles of Industrial Structure Upgrading

The industrial system serves as the cornerstone of both the economy and society, not only mirrors the current state of economic advancement but also significantly impacts the rate at which economic

progress occurs by influencing the structure and dynamics of production, distribution, and consumption. From the perspective of new structural economics, Lin Yifu argues that a industrial structure of a country corresponds to its specific factor endowment structure at any given stage of development, determining the optimal industrial structure for that stage. As the factor endowment structure evolves, the optimal industrial structure also shifts, outlining the optimal path for industrial upgrading in a country or region [1].

Industrial structure upgrading also referred to as industrial transformation or advanced development, involves changes in the industrial structure according to certain regularities and trends as the economy develops. This process is marked by a growing share of industries across the primary, secondary, and tertiary sectors. The upgrading process is evident in three main aspects: First, primary industry is progressively being overshadowed by secondary and tertiary industries, with the latter emerging as the dominant sectors. Second, labor-intensive industries are being increasingly replaced by capital-intensive and technology-intensive industries, which then become the leading sectors. Third, low-value-added industries are being substituted by high-value-added industries, with those involved in producing intermediate and final products gaining greater prominence. Scholars have examined the principles of industrial upgrading from various perspectives. From an industrial policy perspective, policies can enhance the rationalization of industrial structure by addressing market externalities and institutional shortcomings, while also guiding technological innovation to improve efficiency and achieve industrial structural upgrading. Research by Han Yonghui et al. supports the role of industrial policy through both theoretical and empirical evidence [2]. Additionally, Yang Zhifeng et al. developed a two-sector model to analyze changes in China's industrial structure from a technological progress perspective, concluding that the faster technological advancement in heavy industry compared to light industry drives the upgrading of industrial output structure [3]. Furthermore, Han Feng and Yang Ligao explored how the agglomeration of productive service industries such as finance and commercial services fosters manufacturing structure upgrading through economies of scale and technological spillovers, whose research is based on the theory of agglomeration economies, which suggests that when related enterprises and service institutions are geographically concentrated, they can share resources and knowledge, thereby improving efficiency and reducing costs. It is also grounded in endogenous growth theory, which posits that technological progress and innovation are the internal driving forces of economic growth [4].

2.2. Industrial Structure and Upgrading Status in Northeast China

Since the implementation of the Northeast Revitalization Strategy, Northeast China has experienced significant development across its three major industries. Agricultural economic strength has steadily improved, reinforcing its role as a national grain "ballast stone." The industrial economic system has also become more robust, reflecting considerable industrial strength. Additionally, the service sector's contribution to the economy has increased markedly, leading to a notable optimization of the industrial structure.

By the end of 2022, Northeast China's total GDP reached 5,794.63 billion yuan. The output values of the three major industries were 789.65 billion yuan, 2103.30 billion yuan, and 2901.68 billion yuan, respectively, representing 13.63%, 36.30%, and 50.08% of GDP. The tertiary industry alone accounted for over half of the GDP. As shown in Table 1, from 2012 to 2022, Northeast China's GDP exhibited an overall upward trend, although the growth rate gradually decelerated. An analysis by industry reveals that the proportion of the primary industry fluctuated between 13% and 15%, maintaining relative stability. Conversely, the secondary industry has seen a gradual decline since 2012, reaching its lowest point in 2020, the year of the COVID-19 outbreak, at just 33.65% of GDP. It has since rebounded slightly, with the 2022 level approximating that of 2016. The tertiary industry, however, has demonstrated strong growth momentum, surpassing 40% in 2012 and exceeding 50% of GDP within just four years, peaking at 52.04% in 2020.

In conclusion, the proportion of the primary industry in Northeast China has remained stable, while the secondary industry has experienced a slight recent rebound. The tertiary industry has steadily

increased and is nearing stability. These trends indicate that the industrial structure of Northeast China is continuously optimizing and evolving toward a more balanced and reasonable direction.

Table 1. Output value of the three industries in Northeast China and their proportion of GDP from 2012 to 2022 (Unit: billion yuan)

Year	Regional GDP	Primary Industry	Secondary Industry	Tertiary industry	The proportion of each industry in GDP		
					Primary Industry	Secondary Industry	Tertiary industry
2022	5,794.63	789.65	2,103.30	2,901.68	13.63%	36.30%	50.08%
2021	5,559.15	747.91	1,973.81	2,837.42	13.45%	35.51%	51.04%
2020	5,090.08	728.29	1,712.73	2,649.06	14.31%	33.65%	52.04%
2019	5,012.65	664.85	1,725.08	2,622.72	13.26%	34.41%	52.32%
2018	4,761.08	618.24	1,663.65	2,479.19	12.99%	34.94%	52.07%
2017	4,492.80	596.29	1,584.39	2,312.12	13.27%	35.27%	51.46%
2016	4,271.45	572.25	1,545.68	2,153.51	13.40%	36.19%	50.42%
2015	4,191.83	603.66	1,610.93	1,977.24	14.40%	38.43%	47.17%
2014	4,216.30	596.32	1,771.60	1,848.38	14.14%	42.02%	43.84%
2013	4,048.58	576.32	1,797.90	1,674.36	14.24%	44.41%	41.36%
2012	3,754.25	518.45	1,730.18	1,505.61	13.81%	46.09%	40.10%

Although the industrial structure is continually adjusting and progressing towards a more reasonable direction, as illustrated in Figure 1, the growth rates of GDP and the three major industries reveal a declining trend since 2012. The data shows that both GDP and industrial growth rates in Northeast China have been decreasing year by year, with negative growth recorded in 2016. Although there was a rebound in 2017, this momentum was disrupted by the national COVID-19 pandemic in 2020. The growth rate for all industries, except the primary sector, declined significantly, approaching zero growth. Despite some recovery in various growth indicators in 2021, the overall growth rate has remained low, indicating a lack of sustained growth momentum and insufficient economic vitality. These observations underscore the significant challenges Northeast China encounters in advancing its economic development and enhancing its industrial structure through optimization and upgrading.

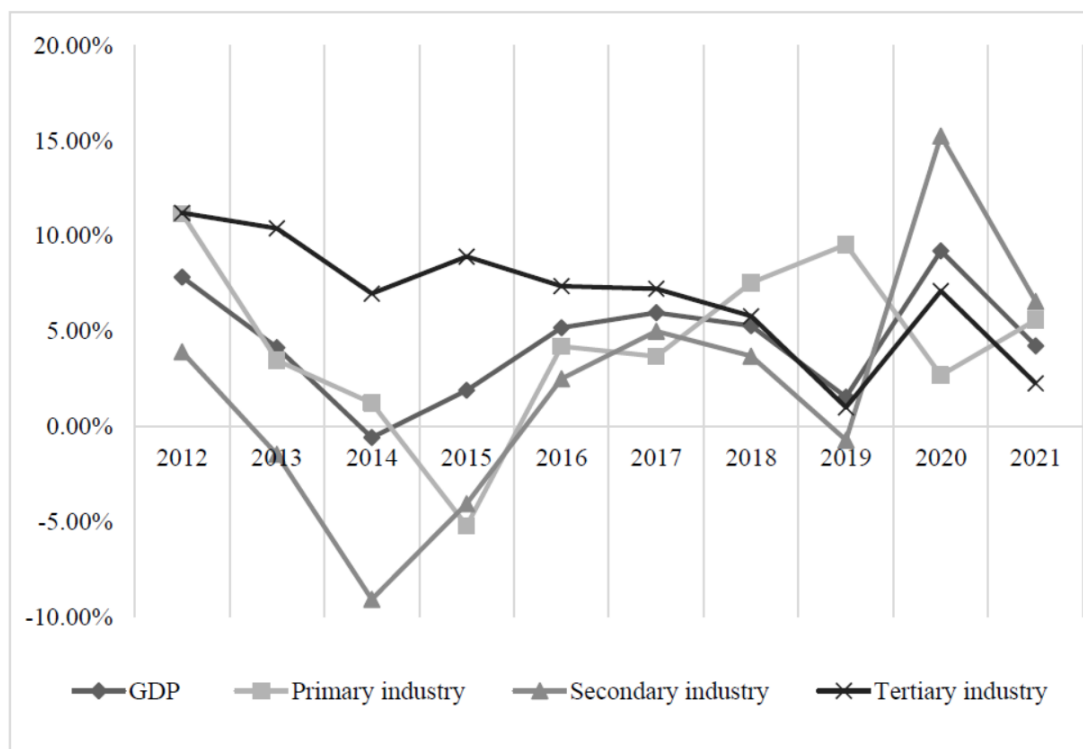


Figure 1. Line chart of GDP and industry growth rates in Northeast China from 2012 to 2022

As illustrated in Figure 2, the proportion of employment in the primary industry in Northeast China has consistently fluctuated around 15% since 2014. After a brief increase in 2019, this proportion quickly reverted to previous levels, indicating that the revitalization strategy has successfully facilitated the transfer of some workers from the primary industry to other sectors. Concurrently, the per capita added value in the primary industry has exhibited consistent growth, reflected the achievements of agricultural modernization and supported the development of agriculture under the revitalization strategy.

Employment in the secondary industry has remained relatively stable but shows an overall declining trend. Although there was a sharp decline in 2019, the employment figures quickly recovered, mirroring the gradual decrease in the secondary industry's share of regional GDP. Despite the increase in per capita added value in the secondary industry, its growth remains inconsistent, suggesting that further development is needed to stabilize and sustain this growth.

In contrast, the tertiary industry has shown robust growth, with both employment numbers and per capita added value consistently increasing. This suggests that the tertiary sector in Northeast China has experienced rapid growth and is progressing in a positive direction, playing a crucial role in optimizing and upgrading the region's industrial structure.

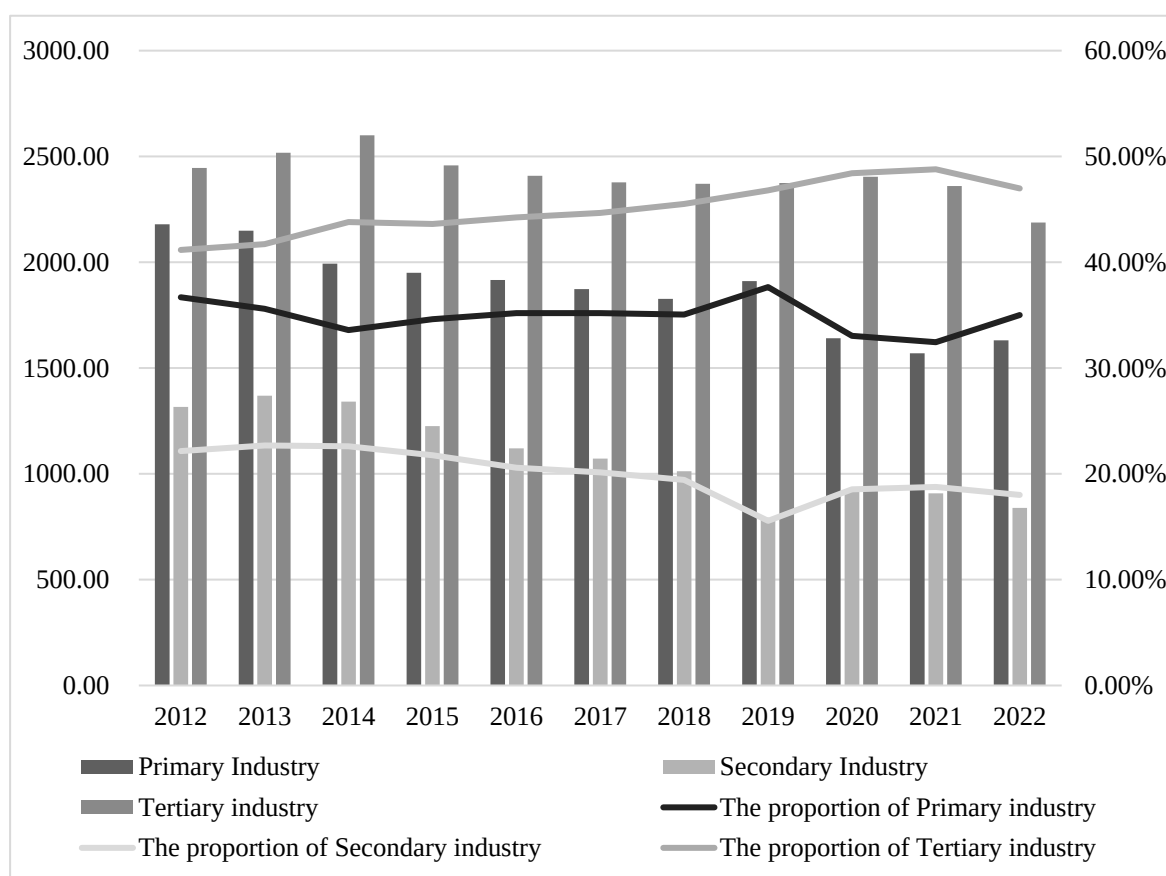


Figure 2. Employment and employment structure of the three industries in Northeast China from 2012 to 2022

2.3. Problems Remaining in the Industrial Structure and Upgrading of Northeast China

The growth rate of the output value across the major industries in Northeast China has been unstable, with significant fluctuations and even negative growth, particularly in the secondary industry. As a key heavy industrial base for the country, Northeast China is striving to develop a more rational industrial structure and identify new economic growth drivers. However, the instability in the growth rates of various industries indicates that Northeast China has yet to find the most effective economic drivers. The region is facing challenges related to insufficient economic momentum and unclear sources of growth.

Additionally, there are issues with the uncoordinated development of the three industries. Despite the secondary industry maintaining a dominant position, with its per capita added value being approximately twice that of the primary and tertiary industries, there are disparities in growth quality. The output value of the tertiary industry constitutes half of the total output, but its per capita added value is comparable to that of the primary industry, which represents less than 15% of the total output. This suggests that while the tertiary industry in Northeast China has achieved significant growth in quantity, the quality of its growth has not improved proportionally.

3. Current Status and Issues in the Financial Sector Since the Implementation of the Northeast Revitalization Strategy

3.1. Theoretical Research Findings Since the Implementation of the Northeast Revitalization Strategy

Since its implementation, the Northeast Revitalization Strategy has yielded relatively positive outcomes. Wang Shijun et al. have highlighted that the strategy has significantly contributed to regional economic development through their analysis of the policy framework [5]. As a region traditionally less prominent in financial development, Northeast China has made substantial progress under the revitalization strategy. The governments of Heilongjiang, Jilin, and Liaoning provinces have introduced various financial support policies, such as the "Guiding Opinions on Financial Support for the Development of Strategic Emerging Industries in Heilongjiang Province," the "Thirteenth Five-Year Plan for the Development of the Financial Industry in Jilin Province," and the "Implementation Plan for Promoting Inclusive Financial Development in Liaoning Province (2016-2020)." These policies have fostered the establishment of a more professional and integrated financial service system, enhancing the alignment between real industry and financial services and addressing issues related to financing and business development.

In 2018, the National Development and Reform Commission, along with other relevant departments, facilitated the creation of the "Northeast Revitalization Financial Cooperation Mechanism," spearheaded by the China Development Bank and other institutions. This initiative aims to develop a more advanced financial mechanism to support Northeast China's industries, improve the quality and efficiency of the real economy's development, and aid in the region's revitalization. Du Li and Gu Hongmei employed an error correction model to demonstrate a positive correlation between the financial employment rate and regional employment rate in Northeast China. Their research underscores the role of financial development in advancing the region's economic progress [6].

3.2. Description of the Current Financial Situation and Financial Structure in Northeast China

3.2.1. Analysis of the current status of the financial development scale

Since the launch of the Northeast Revitalization Strategy, the economic level of Northeast China has an ongoing growth with continuous incremental increases. From 2012 to 2022, the region's GDP rose from 997.73 billion yuan to 5,794.63 billion yuan, indicating steady growth in both economic scale and strength. In parallel with this economic progress, the financial sector across the three northeastern provinces has also seen significant development. The financial development in Northeast China has entered a fast track, with an increasingly robust financial system, steadily improving service quality, and continuously enhancing service efficiency.

This analysis uses year-end deposit and year-end loan balance indicators to illustrate the financial scale of Northeast China. By 2022, the region's total deposit and loan balance reached 25,247.92 billion yuan. Specifically, the deposit balance at the end of 2022 was 2.28 times higher than in 2012, amounting to 14,658.12 billion, with a year-on-year increase of 9.70%. The loan balance, totaling 10,589.79 billion yuan at the end of 2022, was 2.33 times that of 2012, reflecting a year-on-year

growth of 3.78%. Overall, the combined deposit and loan balance increased to 25,247.92 billion yuan, 2.30 times greater than in 2012, with a year-on-year rise of 7.14%. These figures highlight significant growth in both financial scale and overall economic volume.

As illustrated in Figure 3, the growth rates of loans and financial assets remained high from 2012 to 2014, which helped buffer the volatility in deposit growth rates. However, after peaking in 2015, the growth rates of deposits, loans, and financial assets have generally declined, approaching a 10% reduction. This decline reflects a loss of momentum in financial growth within Northeast China. The prolonged decrease in growth rates is closely linked to the nation's critical stage of emergency reform, slower economic development, and increased downward pressure. Although there was a slight increase in growth rates in 2017 and 2018, the deposit growth rate has since become the primary driver of financial asset growth, while the loan growth rate has continued to decline. This trend indicates that the financial sector in Northeast China may have reached a bottleneck, underscoring the need to identify new drivers to stimulate further financial development.

The financial correlation rate represents the ratio between the total volume of social financial activities and the total economic activities during a given period. This indicator reflects the degree of participation and the depth of impact of financial activities in the economic activities of a specific region. The financial system of China is predominantly bank-based now, with bank credit being a primary financial activity. Consequently, this paper uses the balance of deposits and loans compared to regional GDP to determine the financial correlation rate.

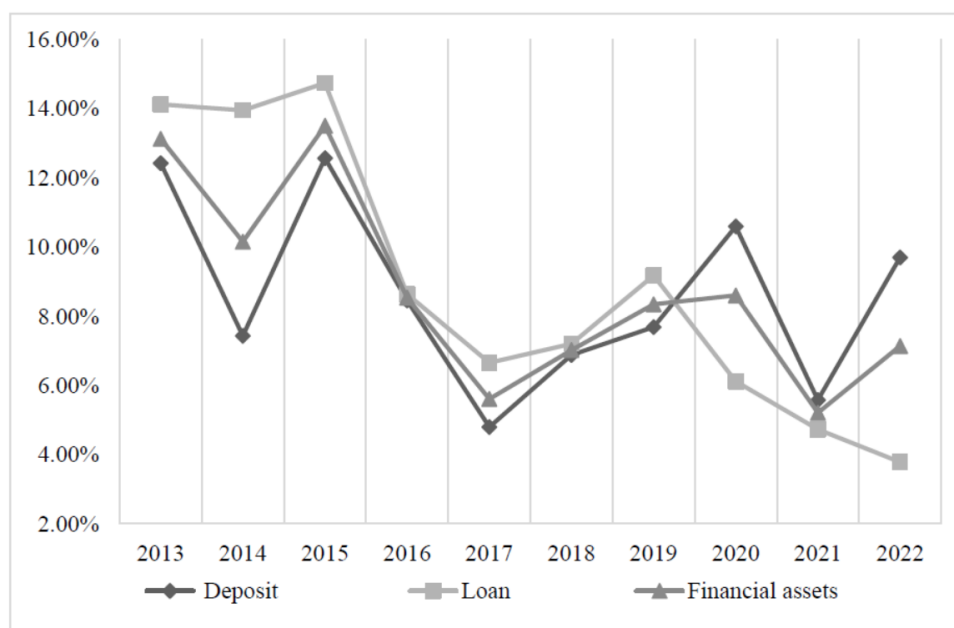


Figure 3. Growth rates of deposits, loans and financial assets of financial institutions in Northeast China from 2012 to 2022

As illustrated in Figure 4, the financial correlation rates for Northeast China exhibit a consistent upward trend. From 2012 to 2020, there was a steady rise, demonstrating that this indicator became more advanced and played a growing role in contributing to regional output during this time. However, a higher financial correlation rate does not necessarily indicate better performance. While a higher rate reflects a greater role of financial development in economic growth, it also suggests an expansion in financial assets without necessarily reflecting the quality and efficiency of financial growth. Therefore, while maintaining a stable financial correlation rate, it is crucial to focus on improving the quality and efficiency of financial development.

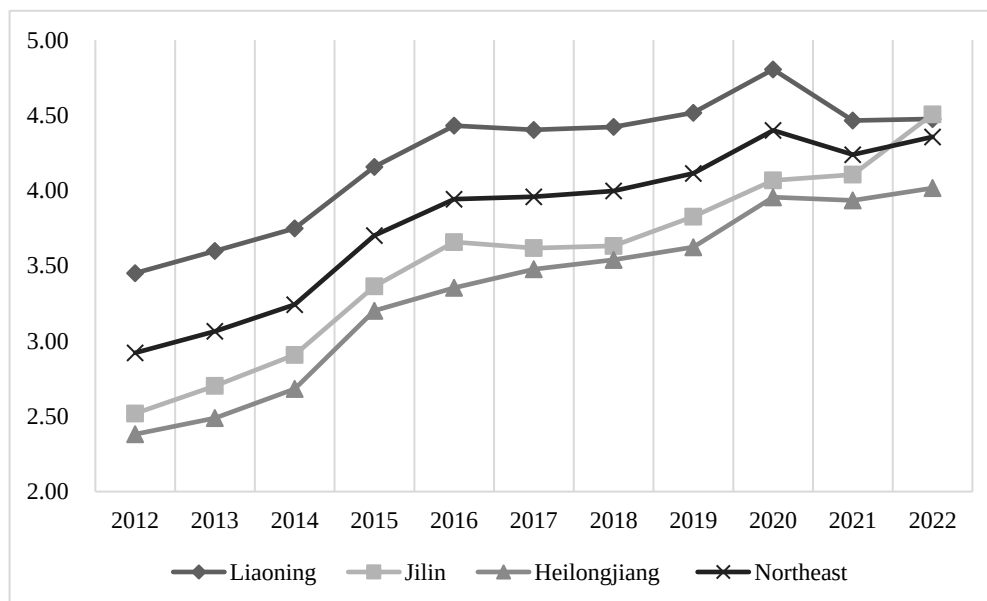


Figure 4. Financial correlation rate in Northeast China from 2012 to 2022

3.2.2. Analysis of financial structure optimization

The financial structure profoundly impacts economic development. Lin Yifu et al. defined financial structure as the distribution and relative proportions of financial institutions within a financial system, shaped by different institutional arrangements [7]. According to the operational characteristics and functional differences of various financial channels, Zuo Zhigang encompassed the financial structure into debt financing, public equity financing, and non-public equity financing [8]. To assess the reasonableness of financial structure, Li Jian and Jia Yuge developed a financial structure analysis framework that includes five aspects: financial industry structure, market structure, and macro, meso, and micro levels [9]. Based on this framework, this paper categorizes the financial structure into three main sectors: banking, securities, and insurance.

By the end of 2022, the total assets of banking financial institutions in the three northeastern provinces of China amounted to 19,916.65 billion yuan. As illustrated in Table 2, among these, state-owned large commercial banks held the highest total assets, amounting to 6,713.74 billion yuan, or 33.71% of the total. Urban commercial banks were the second largest, with total assets of 5,371.61 billion yuan, representing 26.97%. State-owned large commercial banks and urban commercial banks dominate the banking sector in Northeast China. In this region, where industry is a key economic driver, state-owned large commercial banks remain the leading financial institutions, benefiting from robust financial support and a secure government background, which solidifies their position. Urban commercial banks, though smaller, are more agile in capital turnover and have closer connections with local businesses, providing tailored financial support conducive to the region's development.

However, financial intermediaries such as finance companies and trust companies represent a relatively small proportion in terms of number, employee count, and total financial volume. They serve as supplementary options to traditional banking institutions. This indicates that the banking structure in Northeast China remains conservative, with significant potential for innovation and the development of a more diverse financial structure.

Table 2. Basic situation of banking and financial institutions in Northeast China in 2022

Institution Type	Business outlets			Legal entities
	Number of institutions	Number of employees	Total assets (billion yuan)	
Large commercial banks	6,539	147,111	6,713.74	0
Policy banks	234	6,577	1,792.13	0
Joint-stock commercial banks	1,035	25,945	1,698.61	0
City commercial banks	2,280	58,709	5,371.61	17
City credit cooperatives	0	0	0	0
Small rural financial institutions	5,333	80,511	2,513.54	192
Financial companies	9	556	286.95	7
Trust companies	2	513	44.39	3
Postal Savings Bank	4,327	43,706	1,015.93	0
Foreign banks	47	1,288	56.10	0
New rural financial institutions	602	12,468	259.06	169
Others	14	1,452	164.50	7
Total	20,422	378,848	19,916.65	395

The development status of securities institutions in Northeast China is analyzed as follows, with details provided in Table 3. As of the end of 2022, Northeast China is home to only 6 securities firms, 136 fund companies, and 4 futures companies. The distribution of these institutions is notably uneven: all fund companies are concentrated in Liaoning Province, while futures companies are evenly spread across Jilin and Heilongjiang Provinces. Furthermore, the number of securities-related institutions and the volume of stock and bond financing are significantly lower compared to the extensive banking sector in the region. This disparity indicates that Northeast China continues to rely heavily on traditional banking institutions, with the securities market playing a relatively minor role.

Table 3. Basic situation of securities industry in Northeast China in 2022

Project	Number		
	Liaoning Province	Jilin Province	Heilongjiang Province
Number of securities companies headquartered within the jurisdiction	3	2	1
Number of fund companies headquartered within the jurisdiction	136	0	0
Number of futures companies headquartered within the jurisdiction	0	2	2
Number of domestic listed companies at the end of the year	86	49	40
Funds raised by domestic stocks (A shares) in the year (billion yuan)	17.00	2.50	3.84
Funds raised by issuing H shares in the year (billion yuan)	0	0	0
Funds raised by domestic bonds in the year	45.90	49.80	27.38
Among them: Funds raised by short-term financing bonds (billion yuan)	14.70	8.70	5.10
Funds raised by medium-term notes (billion yuan)	19.00	20.70	4.58

The underdevelopment of the securities market is detrimental to the establishment of a multi-level financial market. It also means that a substantial portion of capital remains within the banking system, limiting the efficiency and potential benefits of cross-system fund allocation. This inefficiency hampers Northeast China's ability to develop a more balanced industrial structure through its financial system, thereby constraining regional economic growth. Consequently, promoting the growth of the securities market in Northeast China is crucial for advancing financial development and achieving more robust economic progress.

Finally, examining the development of insurance institutions, it is evident that their distribution across Northeast China is predominantly centered in Liaoning Province, which houses the largest number of headquarters and provincial institutions. In contrast, Jilin Province and Heilongjiang Province also have insurance institutions, though at a lesser scale. This distribution indicates

promising prospects for the development of insurance institutions in Northeast China, with an increasingly refined insurance system playing a significant role in supporting local enterprises and enhancing the social security system.

In recent years, insurance institutions in Northeast China have experienced rapid growth, contributing to the gradual improvement of the insurance system and bolstering their ability to support the region's real economy. This development is crucial for maintaining economic stability and enhancing the social security infrastructure. As shown in Table 4, the number of insurance institutions and premium income in Northeast China has reached a substantial scale, with insurance density achieving a notable level. This establishes a solid foundation for further development of a robust insurance industry in the region. Moving forward, it is essential to continue encouraging the growth of the insurance sector, while further refining the insurance industry system and framework to provide enhanced support for economic development and the optimization of industrial structures in Northeast China.

Table 4. Basic situation of the insurance industry in Northeast China in 2022

Project	Number			
	Liaoning Province	Jilin Province	Heilongjiang Province	Total
Number of insurance companies headquartered in the jurisdiction	5	3	1	9
Among them: Number of Property insurance operating entities	2	3	1	6
Number of Life insurance operating entities	3	0	0	3
Number of Provincial branches of insurance companies	117	38	51	206
Among them: Number of provincial branches of property insurance companies	52	18	22	92
Number of Provincial branches of life insurance companies	65	20	29	114
Premium income (Chinese and foreign capital, billion yuan)	140.15	72.10	98.24	310.49
Among them: Property insurance premium income (Chinese and foreign capital, billion yuan)	40.45	20.0	23.80	84.25
Life insurance premium income (Chinese and foreign capital, billion yuan)	99.70	52.20	74.44	226.34
Various types of compensation payments (Chinese and foreign capital, billion yuan)	51.09	29.30	32.45	112.84
Insurance density (yuan)	333.92	288.67	317.92	940.51

3.2.3. Analysis of financial efficiency

Financial efficiency typically refers to the ratio between the inputs and outputs of the financial sector, specifically the contribution of the financial sector to economic growth. This efficiency reflects how well financial assets are utilized and the effectiveness of financial market allocation. Understanding financial efficiency is crucial for assessing the current state of financial development and identifying strategies for optimizing industrial structure. This paper measures financial development efficiency in Northeast China by examining the difference between year-end deposit and loan balances and the loan-to-deposit ratio.

Table 5 illustrates that the deposit-loan difference remained relatively stable from 2012 to 2019. However, with the onset of the COVID-19 pandemic, this difference increased significantly, reaching 4068.331 billion yuan by 2022. This trend suggests that the demand for residents' savings may continue to grow in the future. The loan-to-deposit ratio has shown an upward trend since 2012, peaking at 80.24% in 2019. Nonetheless, this positive trend was disrupted by the pandemic, resulting in the ratio stabilizing around 75% in recent years. This indicates that a substantial amount of funds in Northeast China remains unutilized in supporting enterprise development, reflecting an underutilization of available financial resources. Moving forward, it is essential to enhance the

deployment of these funds into areas requiring financial support to stimulate economic growth in the Northeast China region.

Table 5. Financial efficiency in Northeast China from 2012 to 2022(Unit: billion yuan)

Year	Year-end Deposit balance	Year-end Loan balance	Deposit-loan difference	Loan-to-deposit ratio (%)
2022	14,658.12	10,589.79	4,068.33	72.25%
2021	13,361.96	10,203.74	3,158.22	76.36%
2020	12,656.05	9,743.15	2,912.90	76.98%
2019	11,443.35	9,181.62	2,261.73	80.24%
2018	10,626.49	8,409.76	2,216.72	79.14%
2017	9,942.68	7,844.68	2,098.00	78.90%
2016	9,487.54	7,355.17	2,132.37	77.52%
2015	8,747.67	6,770.08	1,977.59	77.39%
2014	7,770.80	5,900.25	1,870.55	75.93%
2013	7,233.12	5,177.80	2,055.33	71.58%
2012	6,433.62	4,536.88	1,896.74	70.52%

3.3. Problems in Financial Development Since the Implementation of the Northeast Revitalization Strategy

However, financial development in Northeast China continues to face challenges in the new era. Zhou Shutong et al., using a binary VAR model, argue that due to relatively severe "financial repression," there exists an asymmetric relationship between the growth of the economy and the development of the financial sector in Northeast China. Specifically, while financial development supports economic growth, the reverse effect—economic growth promoting financial development—is less pronounced [10]. Qi Meidong and Yan Chunying highlight that the regional imbalance in the allocation of financial resources has constrained the establishment of a robust financial support system in Northeast China [11]. Furthermore, Yan Chunying notes that financial innovation in the region remains inadequate, with a high degree of homogeneous competition. Despite the sufficient number of financial institutions, their core businesses are similar, and there is a need to enhance services driven by customer demand [12].

3.4. Summary of Problems in Financial Development Since the Implementation of the Northeast Revitalization Strategy

The financial market in Northeast China remains relatively small in scale and underdeveloped. As shown in Table 6, Northeast China exhibits a higher financial correlation rate compared to central provinces like Henan and more developed regions such as Jiangsu. This indicates that finance plays a significant role in the region's economic development. However, the market's limited size and low level of financialization suggest that further development is needed to fully harness the potential of financial services in supporting economic growth.

The financial structure in Northeast China remains relatively simplistic and heavily reliant on the banking sector, leading to a concentration of social funds within this industry. An analysis of the financial institutions reveals that the bank dominates both in terms of the number of institutions and the volume of funds managed. This dependency creates several issues: first, many enterprises are limited to obtaining funds primarily through banks, which tend to favor large enterprises with lower risks and stronger financial positions. Consequently, small and medium-sized enterprises (SMEs) often struggle to secure financing. Second, the securities and insurance sectors are underdeveloped, resulting in insufficient capital flow into these areas. This lack of diversity in financial channels makes it challenging for SMEs to raise funds through alternative means such as stock or bond issuance, impeding their development and the overall industrial upgrading process.

Table 6. Comparison of financial development indicators between Northeast China and other regions in 2022 (Unit: billion yuan)

Region	Deposit balance	Loan balance	Total deposits and loans	Financial correlation rate	GDP
Liaoning	7537.57	5432.10	12969.67	4.48	2897.51
Jilin	3259.54	2631.38	5890.92	4.51	1307.02
Heilongjiang	3861.02	2526.31	6387.33	4.02	1590.10
Northeast	14658.12	10589.79	25247.92	4.36	5794.63
Henan	9254.84	7552.85	16807.69	2.74	6134.51
Jiangsu	21869.58	20684.54	42554.11	3.46	12287.56
National	258500	213985	472485	3.95	119725.04

Furthermore, the overall financial efficiency in Northeast China is low. The limited range of investment channels and the predominance of savings over other forms of investment mean that social capital is often concentrated in savings accounts rather than being actively invested in the economy. This low conversion efficiency hinders the allocation of idle funds to advanced industries that require investment. As a result, the inability to effectively utilize available capital exacerbates the difficulties faced by SMEs and stifles efforts to upgrade and transform the region's industrial structure.

4. The Impact of Financial Structure Optimization on Industrial Structure Upgrading

The financial structure profoundly influences economic development. Fan Fangzhi and Zhang Lijun divided China into three regions and conducted a study on the interplay between the development of financial institutions and the upgrading of industrial structures. Their research revealed that the development level of finance has a substantial influence on the process of the upgrading of industrial structure. This upgrading, in turn, plays a crucial role in driving economic growth. The study highlighted that in regions with more advanced financial institutions, industrial structures are more likely to undergo significant improvements, leading to enhanced economic performance. Conversely, in areas with less developed financial systems, the pace of industrial upgrading and economic growth may be slower, indicating that the development of financial institutions is a key factor in fostering regional economic advancement [13]. Similarly, Liu Lizhen and Wang Qinglong assert that the revitalization of Northeast China should leverage financial support to assist the region's economy in overcoming difficulties and transforming its industrial structure towards higher-end, information-based, and intelligent sectors [14].

The role of financial structure optimization in promoting industrial upgrading is evident through the enhancement and deepening of financial services provided to the real economy. This paper deconstructs the financial structure into three components: financial institutions, financial instruments, and financial markets. Financial institutions absorb idle resources from the public and offer financial instruments to real enterprises, thereby creating a comprehensive financial market.

Financial institutions play a crucial role in this process. They raise funds through various means such as deposits, bonds, and insurance, gathering substantial idle resources from society. These institutions then reorganize these funds into different types of financial assets based on the needs of enterprises seeking capital. These assets are sold to those in need, with financial institutions earning income from interest, thereby maintaining their operations. This process transforms idle funds into capital for the development of the real economy, directing it towards enterprises that require it most and phasing out less viable industries, thus facilitating industrial structure upgrading.

Gong Qiang et al. view financial structure as the composition of banks and stock markets, suggesting that a financial system dominated by mature industries and banks in developing countries supports economic growth [15]. Zhang Yilin et al. explored the relationship between banking industry structure and industrial structure, revealing that optimal banking structures vary with a country's development stage, with enterprise size distribution being a key determinant [16]. Financial

instruments, both traditional (such as banknotes, stocks, and bonds) and innovative derivatives, play a role in industrial upgrading due to their diversity. These instruments allow enterprises to select and combine the most suitable capital sources while dispersing risks. Technological advancements continually introduce new financial instruments, enabling innovative enterprises to access higher returns and drive industrial innovation.

The financial market's primary advantage is its capacity to reduce information asymmetry and transaction costs. Yu Binbin posits that financial markets foster economic growth by optimizing industrial structure through financial aggregation [17]. An efficient financial market minimizes information asymmetry through price mechanisms and trading systems, thereby lowering transaction costs. Capital suppliers provide funds at lower costs, while capital demanders can efficiently obtain necessary funds. Regulatory mechanisms and user supervision further ensure market efficiency. Enhanced liquidity and flexibility of financial market transactions support capital allocation to high-return projects, benefiting emerging industries and driving industrial structure upgrading.

Financial policies also influence the financial structure independently of institutions, instruments, and markets. They guide capital towards high-tech and emerging industries, optimize resource allocation, and foster transformation through interest rate adjustments, credit regulation, and financial innovation. Market-oriented reforms, such as financial instrument innovation, improve financial system efficiency, reduce corporate financing costs, and support growth potential and innovative industries. Ma Zhili and Zhou Xiangyu argued that there exists a long-term equilibrium relationship between indicators of industrial structure upgrading and financial development. Both the financial correlation rate and the degree of financial marketization positively contribute to the increase in the proportion of non-agricultural industry output. Additionally, the impact of the financial correlation rate on industrial structure upgrading is stronger than that of the financial marketization rate [18]. Additionally, risk prevention and control policies enhance financial supervision, ensuring system stability and providing a foundation for industrial upgrading. Synergies between financial and industrial policies direct resources toward strategic industries, promoting the rapid development of emerging sectors.

5. Conclusion

Since its inception, the Northeast Revitalization Strategy has garnered significant scholarly attention. This paper examines the financial structure in the context of the Northeast Revitalization, drawing on existing research to highlight both the achievements and challenges encountered since the strategy's implementation. It affirms the positive impact of the financial structure on industrial upgrading and provides a theoretical analysis of how financial structure contributes to this process.

Despite these insights, there remains a gap in the specific analysis of how financial structure optimization influences industrial upgrading in Northeast China. This paper aims to offer a comprehensive financial perspective to advance research and development in this area. By doing so, it seeks to provide theoretical guidance and policy recommendations to address the practical issues faced during the revitalization process. Ultimately, the goal is to support the economic development of Northeast China and facilitate its successful revitalization.

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