

Evaluating the impact of different sustainable leadership: Its influence on state-owned enterprises' performance in Northeast China

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Abstract: This study delves into the nuanced impact of leadership styles on state-owned enterprises (SOEs) performance in Northeast China. It aims to discern how transformational, transactional, and authoritative leadership approaches influence organizational outcomes, framed within the context of sustainable leadership theory. Employing a quantitative methodology, the research analyzes survey data from employees across various SOEs to assess the relationship between leadership styles and company performance, including aspects such as job satisfaction, employee motivation, and operational efficiency. The findings reveal a clear dichotomy: transformational and transactional leadership styles positively correlate with improved performance metrics, fostering an environment of innovation, motivation, and job satisfaction. Conversely, authoritative leadership is shown to detrimentally affect these same metrics, potentially hindering organizational growth and employee morale. This research contributes to the broader discourse on leadership and organizational performance by highlighting the critical role of leadership style in enhancing the sustainable development of SOEs, particularly within China's socio-political and economic fabric. Practical implications suggest a shift towards more adaptive, employee-centered leadership approaches to spur performance and sustainability in SOEs. The originality of this study lies in its specific focus on the Chinese context, offering insights into the leadership dynamics within SOEs and proposing actionable strategies for fostering leadership that align with sustainability and organizational excellence principles.

Keywords: transformational leadership; transactional leadership; authoritative leadership; state-owned enterprises; company performance

1. Introduction

This comprehensive research delves into the critical role of state-owned enterprises (SOEs) in global economies, particularly in Asia and other emerging nations. It outlines the evolution, challenges, and strategic importance of SOEs, especially in the context of China, and examines the impact of leadership styles on their performance.

State-owned enterprises are pivotal in many economies, especially in Asia and emerging countries. As Le et al. (2021) state, these enterprises form a significant part of economic development and construction. They are often responsible for a substantial portion of economic infrastructure investment, as highlighted by Gaspar et al. (2020). In Africa, state-owned enterprises are seen as crucial economic entities,

leading many governments to legally bolster their presence in the market to fuel national economic growth (Jeremiah et al., 2023). These enterprises blend market economy status with state regime decision-making, significantly influencing national economic trends (Bałtowski and Kwiatkowski, 2022). The Northeast region of China, a major industrial base, predominantly consists of SOEs. However, the legacy of a planned economy and challenges following China's economic reforms have impacted these enterprises' leading position. Despite a revitalization plan proposed in 2003, strategic goals have largely remained unachieved, with reasons for this failure being diverse and discussions on them varied (Callais and Peng, 2022). Globally, the prominence of SOEs has risen sharply. In 2000, there were 27 SOEs among the world's top 500 enterprises, soaring to 102 by 2017. These enterprises accounted for a fifth of the top list and 22% of total revenue, with a significant portion being Chinese state-owned enterprises (Lin et al., 2020).

In China, the spread of state-owned assets across various industries is extensive, covering areas like healthcare, education, and the military. Post-economic reforms, these enterprises undergo regular restructuring every 3–5 years. While central and large enterprises are the focus of SOE reforms, managing smaller enterprises remains a challenge. The reform process has often failed to establish an ideal enterprise structure and management system (Bai and Zhu, 2019).

Leadership is crucial in managing the complexities of organizational environments, especially in a globalized and technologically advanced world. Leadership is intertwined with concepts of power, authority, influence, and persuasion (Meirinhos et al., 2023). The evolving business landscape necessitates a new leadership paradigm that balances various pillars like the environment, culture, and economy for sustainable performance (Piwowar-Sulej and Iqbal, 2023). Qin (2023) observes that SOEs lag behind private enterprises in asset returns and profitability. However, they contribute significantly to national development by reducing private investment in public facilities and stabilizing economic growth. SOEs also foster technological advancement and provide stable employment (Qi and Kotz, 2019).

The lack of strategic cooperation in SOEs is often linked to leadership styles. Different leadership approaches can influence employee belonging and satisfaction, subsequently affecting company performance (Arif and Sule, 2020; Colovic, 2022). Research indicates that many SOEs suffer from ineffective leadership, hindering their operational efficiency. Therefore, exploring varied leadership styles and implementing them in SOE management could enhance the performance of underperforming SOEs, leading to sustainable development (Jeremiah et al., 2023). This research underscores the significant role of SOEs in global economies, particularly in China, and the challenges they face due to historical, structural, and managerial factors. It also highlights the need for effective leadership styles to improve SOE performance and contribute to sustainable economic growth.

When it comes to China's state-owned enterprises, scholars typically compare their governance attributes to international corporate governance standards and conclude that China's governance institutions are lacking or dysfunctional (Zhang, 2011). This common approach focuses on the function of things (i.e., rules and structures) while ignoring the character of humans. The philosophy underlying this approach is to seek corporate governance based on the rule of law rather than the rule

of man. This approach promises a functional legal regime for corporate governance that can reduce the arbitrariness exercised by humans (Li-Wen, 2013). The flip side of this underlying philosophy, however, implies that the personal characteristics of corporate leaders can significantly impact the quality of corporate governance—particularly when legal institutions are weak, as in China. As a result, focusing solely on rules or structures without delving into leadership is insufficient for understanding the full picture of Chinese state-owned enterprises' governance.

The importance of leadership qualities in SOE governance is complicated further by China's political structures. The Chinese state-owner is not a typical controlling shareholder. The Chinese Communist Party is the true hand in the glove of state ownership in China (Li-Wen, 2013). As China's sole ruling party, it has complete control over all major institutions in politics, business, the media, academia, and all other aspects of public life. The primary control mechanism is the Party's sophisticated but opaque personnel management of key positions in important institutions, including SOEs (Chen, 2004). As one commentator points out, "the Party's control over personnel was at the heart of its ability to overhaul state companies while maintaining leverage over them." 4 The Party's executive career management directly impacts managerial incentives, which in turn influence the corporate behavior of China's state-owned enterprises.

This study fills a critical gap in the existing literature regarding the leadership styles prevalent in state-owned enterprises. By elucidating the nuances of leadership strategies in state-owned enterprises, this study provides invaluable insights and a solid framework for future researchers interested in the complex dynamics of state ownership and its implications for leadership efficacy. Furthermore, it provides empirical support for the discussion of leadership styles within SOEs, paving the way for a more nuanced understanding of how state ownership influences leadership approaches. Given the possibility of an increased share of SOEs in the market, the findings of this study are poised to serve as a foundation for future investigations into the reform and evolution of state-owned enterprises, particularly considering leadership style transformations.

This research is especially important in the Chinese economy, where the state-owned sector serves as a linchpin in a diverse economic landscape. With a particular emphasis on Northeast China, where state ownership dominates the heavy industry and energy sectors, this study sheds light on the operational challenges faced by SOEs in comparison to their private counterparts. By identifying the underlying issues that impede SOE performance in this region, the study highlights critical areas for improvement and validates the feasibility of implementing strategic measures to promote sustainable development. As a result, this research promises to assist SOEs in Northeast China in optimizing their operational efficiencies, thereby improving profitability and return on investment in an environment marked by intense competition and changing market demands. Together, these contributions provide a comprehensive overview of the potential for leadership style innovation within SOEs and highlight strategic pathways for improving operational efficacy, representing a significant advance in both academic research and industry practice.

2. Literature review

2.1. State owned enterprise (SOE)

State-owned enterprises refer to enterprises owned or controlled by the state. They achieve financial goals through commercial means. They are semi-official institutions and are also tools for official market management. In fact, many state-owned enterprises are not for profit, for example, China Post (Albert, 2023). Although state-owned enterprises are profitable commercial entities, there are also many state-owned enterprises that do not generate profits or even lose money, such as China Post and China Railway. These enterprises play an important role in the construction and development of the country and can only continue with government financial allocations (Kenton, 2020). The Organization for Economic Cooperation and Development defines state-owned enterprises as “either controlled by the state, or owned by the state as the ultimate person with the greatest decision-making power, or controlled by the state in other ways,” and state-owned enterprises are the main contributors to the economy (Lord, 2021).

2.2. Global state-owned enterprises

State-owned enterprises refer to enterprises owned or controlled by the government that provide services or goods to the public and usually compete with private enterprises (Trebilcock, 2021). State-owned enterprises play an important role in various countries around the world. They use their market position and economic activities to help the country realize its economic functions. Many countries in the world have implemented economic policies dominated by state-owned enterprises (Bałtowski and Kwiatkowski, 2022).

But the performance of state-owned enterprises on a global scale is disappointing. The performance of state-owned enterprises is far worse than that of private enterprises. Even if they try to reform to improve their financial status and operating performance, the effect is still not good (Kikeri, 2022). Even so, state-owned enterprises still play an extremely important role in many countries. For example, in Asian countries, among the top ten enterprises in Malaysia, Chinese enterprises account for 68%, Indonesia 69%, and India 59%. State-owned enterprises contribute to the VNR500 list. More than half (52%) of the total income, they control the country’s economic lifeline, such as gas, water, electricity, and other important areas (Le et al., 2021). State-owned enterprises are an important means of maintaining the state’s control over key economic enterprises, and it is also one of the characteristics of many emerging economies and developed countries (Pekao, 2020).

Although privatization has been carried out globally, state-owned enterprises still play an important role. In the past 20 years, the share of state-owned enterprises in the 2000 largest enterprises has doubled to 20%, which is enough to prove that state-owned enterprises The importance of businesses for the development of global GDP and the quality of public services (Miążek, 2021).

2.3. Chinese state-owned enterprises (SOE)

State-owned enterprises (SOEs) are integral to China’s economy, underpinning

the country's substantial growth over the past four decades. Despite their efficiency being questioned, their role in China's past and prospective economic landscape is significant (Szarzec, 2021). However, recent years have seen a slowdown in China's development (Lin et al., 2019). Initially, SOEs were established to reduce financial burdens, but governmental interventions have hindered their ability to achieve financial sustainability (Lee et al., 2022). The importance of SOEs to the Chinese government is threefold. First, they maximize the mobilization of social resources and foster the growth of intensive industries with long investment cycles and slow returns, where market forces alone are insufficient. Second, SOEs contribute to social stability by providing employment for excess human resources. Third, they facilitate government control over crucial production factors like water and electricity (Lin et al., 2019). Additionally, SOEs have played a critical role in helping China navigate crises, exemplified by their response to the COVID-19 pandemic in resource coordination and economic stabilization (Pekao, 2020).

In response to inefficiencies and developmental slowdowns, China is reforming its SOEs. This includes adopting mixed-ownership reforms, shifting towards market-based management models (Zeng et al., 2023), and partially privatizing non-essential SOE sectors (Cardinale, 2022). Chinese SOEs align with the concept of social enterprises, prioritizing social responsibility over profit. Balancing this social responsibility with financial performance presents a primary challenge for the future of Chinese SOEs (Lin et al., 2020).

2.4. Company performance

Enterprise performance management, crucial for the sound and healthy development of companies, typically involves measuring performance through financial and Key Performance Indicator (KPI) data (Jaklič et al., 2021). It establishes a system within organizations to assess and enhance employee performance, thereby boosting overall company performance. This approach not only aids in employee development but also plays a key role in talent retention (Andreev, 2023). In the context of today's rapidly changing and uncertain business environment, where companies face significant challenges, continuous evaluation and improvement of corporate performance are vital. Businesses are increasingly focusing on performance management as a means to achieve efficiency, quality, and cost-effectiveness (Taouab and Issor, 2019). A major component of corporate performance hinges on motivation theory. Management strategies that offer rewards or penalties based on employee needs can effectively motivate staff. Performance is seen as a function of motivation, ability, and the working environment (**Figure 1**), where motivation drives performance, ability sets its limits, and environmental factors, including resources provided by the firm, influence outcomes (Mitchell, 1982).



Figure 1. Job Performance (Mitchel, 1982; Porter and Lawler, 1968).

2.5. SOE performance

China's economic progress is closely tied to its unique socio-political and economic environment, where many listed companies originate from state-owned enterprises (SOEs), making them a crucial area of study (Kong et al., 2019). SOEs, which the state partially or wholly owns or controls, often face criticism for their financial underperformance compared to private firms. This underperformance is attributed to various factors, including agency problems, lack of regulatory clarity, soft budget constraints, and cronyism (Matuszak and Kabaciński, 2021; Tang et al., 2022).

Globally, SOEs account for about a tenth of the global GDP and over 10% of the world's largest market-value companies. A common reform in these enterprises is the introduction of mixed ownership, referred to as partial state ownership (Carney et al., 2021). Historically, SOEs were significantly developed in two waves between the 1900s and the 1970s, initially during the interwar period and later post-World War II. This development aimed to support new industries, stabilize the national economy, increase employment, and enhance public sector strength.

Despite their size and impact, most studies suggest that SOEs underperform compared to private firms due to factors like soft budget constraints, political misuse, and policy maker's lack of industry foresight (Szarzec et al., 2021). However, it has been argued that the primary aim of SOEs is not profit maximization but to fulfill social responsibilities, such as maintaining social stability and ensuring employment (Lin et al., 2020).

Many countries, including China, have initiated reforms to improve SOE performance. China's SOE reform in the 1990s resulted in significant layoffs, highlighting the need for improved efficiency. Similarly, Western and transitioning countries have pursued large-scale privatization, believing it to be the key to efficiency (Hong, 2020). Despite having advantages like government support and resource preference, the performance of Chinese SOEs remains suboptimal. This is partly because the favorable policies and business environments they enjoy do not accurately reflect their earnings performance (Hong, 2020). Thus, while SOEs play a significant role in many fields, their effectiveness and efficiency continue to be areas of contention and reform.

2.6. Different leadership styles

2.6.1. Transformational leadership style

The concept of change leadership theory, initially proposed by Burns (1978) and later expanded by Bass et al. (1994) focuses on leadership that motivates subordinates towards organizational goals rather than personal interests. Bass and Avolio (1996) identified four core characteristics of transformational leadership: intellectual stimulation, idealized influence, individualized consideration, and inspirational motivation (Qalati et al., 2022).

Transformational leadership is defined by the ability of a leader to inspire employees to exceed expectations, enhancing their intrinsic motivation (Khan et al., 2020). This leadership style comprises elements like individualized consideration, motivation, idealized influence, and intellectual stimulation (Wen et al., 2019). Transformational leaders often drive subordinates to challenge their work and secure

resources, thus optimizing their work involvement and methods using personal strengths (Bakker et al., 2022). Transformational leaders excel in follower development, focus on processes, and establish trust-based commitments. This approach motivates followers to perform beyond expectations, leading them to find joy and satisfaction in their work, consequently being more positive, less stressed, and more committed to the organization (Khan et al., 2020; Wen et al., 2019).

However, transformational leadership is not without flaws. Some leaders with this style may exhibit traits akin to narcissistic personality disorder as classified by the American Psychiatric Association, characterized by extremity, grandiosity, power hunger, and hostility (O'Reilly and Chatman, 2020). Additionally, such leaders can inadvertently lead to emotional exhaustion among subordinates, increasing turnover rates, especially when followers exert significant effort but possess limited capabilities (Lin et al., 2019).

2.6.2. Transactional leadership style

Transactional leadership, also known as managerial leadership, is a style centered around supervision, organization, and team performance. This approach uses rewards and punishments to ensure follower obedience, emphasizing maintenance of the status quo rather than seeking transformative changes (Jaqua, 2021). Originating from motivation theory, transactional leadership caters to the motivational needs of achievement, affiliation, and power, effectively enhancing subordinate performance (Jaqua, 2021). Organizational performance is intrinsically linked to employee performance, which is influenced by the leadership style. Employees working under various leaders, like managers or directors, drive organizational performance through their ideas, operations, achievements, and responses to external competition (Muwardi et al., 2020). Studies indicate that transactional leadership and factors like organizational culture positively impact employee job performance (Alrowwad et al., 2020).

Transactional leaders, focusing on roles like supervision and organization, prefer using rewards and punishments to maintain subordinate obedience and achieve urgent task completion (Thanh and Quang, 2022). They aim to improve company performance and encourage employees to evolve into future leaders by identifying and addressing their needs and offering rewards post-performance (Wahyuni et al., 2019). The essence of transactional leadership lies in encouraging performance-based rewards (Abdelwahed et al., 2023). These leaders are often more effective in enhancing employee performance through the promise of greater rewards for increased effort (Rathi et al., 2021). Essential leadership skills such as collaborative leadership, emotional intelligence, and crisis management are crucial for a leader's response to crises (Schaedler et al., 2022).

However, a major limitation of transactional leadership is its inability to build meaningful relationships with employees and address their emotional needs. Focusing more on control than care, this approach often neglects humanistic aspects of leadership, which are essential for a truly effective leader (Philips and Norman, 2019). Thus, while transactional leadership can drive immediate performance, its lack of focus on employee relationships and emotions may hinder long-term organizational success.

2.6.3. Authoritative leadership style

Authoritarian leadership, particularly during crises, is characterized by a defensive approach to risk-taking, perceiving risk as a threat (Plessis and Keyter, 2020). These leaders demand strict obedience from subordinates, often actively handling organizational matters through rewards or punishments. Resistant to accepting suggestions, authoritarian leaders prefer imposing their will without considering input from their subordinates, even if it is valid (Otieno and Njoroge, 2019; Ullah et al., 2022).

Authoritative leadership provides clear direction and vision, ensuring followers understand organizational goals and the definition of success. This leadership style positively influences team unity and trust, and prevents leader laxity in daily work processes (Zabolotniaia et al., 2019). Despite traditional negative connotations associated with authoritative leadership, such as blind obedience to authority and concentration of power, it remains a prevalent style in China. It has been particularly effective during the COVID-19 pandemic, aiding in emergency management, maintaining public trust, and fostering quick consensus (Gao and Zhang, 2021; Yang and Huang, 2021).

However, the fundamental intention of authoritative leaders is control. While their goals may align with those of the employees and aim for a shared organizational vision, this style often stifles employee creativity, limiting the potential for innovative solutions and growth (Karakitapoğlu-Aygün et al., 2019). Therefore, while authoritative leadership can be effective in crisis situations, its control-centric approach can be detrimental to fostering a creative and dynamic work environment.

2.6.4. Leadership styles and company performance

Leadership is critical in developing an effective organization (Jacob Cherian et al., 2020). It focuses on the growth of followers and their requirements. Prior literature on leadership depicts it as a personal skill. According to Messick and Kramer (2004), the extent to which an individual demonstrates leadership traits is determined by the circumstances and environment in which he finds himself. There are various leadership styles, each with its own approach to directing and guiding employees and subordinates. Numerous studies have demonstrated the unavoidable role of leadership in determining company performance (Cherian, et al., 2020). Leadership styles have a significant impact on company performance. The leadership style influences the organization's culture, which in turn influences its performance. Klien et al. (2013) demonstrated this fact by utilizing the four-factor theory of leadership and data collected from 2662 employees working in 311 organizations.

According to Sharmin (2023), leadership is generally defined as the natural action of guiding people to make their efforts explicit in pursuit of some appropriate goals. It is assumed that the type of leadership style used in an organization influences its long-term success. The right leadership style influences employees' productivity, willingness, and happiness with their jobs. In today's business, leadership style is critical, focusing on employees' talents, growth, and values. To survive in a competitive business environment for an extended period of time, organizations must improve employee enforcement by adjusting the appropriate leadership style. So, it is critical to investigate why different leadership styles have an impact on organizational

performance.

2.7. Underlying theory

This study, anchored in Kurt Lewin's (1939) leadership theory, explores the relationship between leadership styles and their impact on subordinates and organizational outcomes. Historically, research has shifted from focusing on inherent leader qualities, as per the great man method, to examining ongoing dynamics like decision-making interactions and performance impacts on subordinates. Contemporary leadership theory also addresses controversies in personality measures and provides a theoretical framework for understanding the mechanisms and generalizability of these relationships (Thanh et al., 2022). Intrinsic and extrinsic motivation plays a critical role in an individual's performance. Fueled by motivation, positive employee performance can enhance overall company performance. There is a positive correlation between intrinsic motivation and job satisfaction, with leadership style significantly affecting job satisfaction. Effective leadership is instrumental in improving company performance (Pancasila et al., 2020).

Leadership, a complex and multi-dimensional concept, is especially crucial in today's rapidly changing world (Benmira and Agboola, 2020). It is categorized into several theories, including leadership trait theory, charismatic leadership theory, goal leadership theory, contingency theory, and group and communication theory. These theories, reflecting the influence of their respective historical contexts, encompass various styles like transformational, transactional, and authoritative leadership. Each style has distinct characteristics that significantly affect employee performance. The study of different leadership styles and their influence on employee performance and motivation is foundational in understanding how leadership impacts organizational success (Sui Fan, 2020).

3. Method

This study adopts a quantitative, descriptive approach to explore how various leadership styles influence the performance of state-owned enterprises in Northeast China. We gathered primary data through carefully crafted questionnaires, a pivotal element of our research aimed at reducing errors and biases, as highlighted by Taherdoost et al. (2022). Our study population consisted of 5246 state-owned enterprises across three northeastern provinces: Heilongjiang, Liaoning, and Jilin. Following Ndam's (2020) recommendation for a 5% margin of error, we determined a sample size of 357 respondents. The participants, comprising owners and managers, served as the primary unit of analysis for this study. To assess the questionnaire's validity, we conducted a pilot test with 36 respondents, approximately 10% of our intended sample size, as suggested by Wardropper et al. (2021). Given the challenges associated with data collection from state-owned enterprises in these provinces, we distributed 1000 questionnaires and received 798 usable responses. Unfortunately, 202 questionnaires were excluded due to incomplete data, such as missing demographic details or incomplete Likert scale responses. The questionnaire was divided into demographic information (e.g., gender, age, education, position, number of employees), company performance (the dependent variable), and leadership styles (the

independent variable). We utilized an online platform, questionnaire star, for data collection and disseminating the questionnaires via social media channels. For data analysis, we performed a factor analysis to identify latent constructs, utilizing SPSS version 28. The Kaiser-Meyer-Olkin (KMO) test verified the data's appropriateness for factor analysis, and Cronbach's Alpha was used to evaluate internal consistency and reliability. We employed multiple regression analysis to understand the impact of leadership styles on company performance. This method allowed us to predict the value of the dependent variable based on the independent variables, thereby offering a thorough insight into the leadership styles' effects on company performance in the targeted region.

4. Results and discussion

4.1. Pilot test

Results from the pilot study offer a thorough examination of the relationship between the dependent variable (business performance) and the independent variables (transformational, transactional, and authoritative leadership styles), as shown in **Tables 1** and **2**. The study's significance (Sig.) values are less than the 0.05 threshold, which confirms that the factor analysis was feasible and that the sampling methods were adequate. In addition, the Kaiser-Meyer-Olkin (KMO) test results for sampling adequacy are strong; there is a KMO value of 0.87 for the dependent variable and 0.824 for the independent variables. These values significantly surpass the acceptable threshold of 0.6, which further supports that the sample size is sufficient and appropriate for this research.

Table 1. KMO and bartlett's test.

Kaiser-Meyer-Olkin measure of sampling adequacy		0.870
	Approx. chi-square	124.408
Bartlett's test of sphericity	df	10
	Sig.	0.000

Table 2. KMO and Bartlett's test-pilot test.

Kaiser-Meyer-Olkin measure of sampling adequacy		0.784
	Approx. chi-square	365.187
Bartlett's test of sphericity	df	105
	Sig.	0.000

The study's independent and dependent variables' Cronbach's Alpha values are displayed in **Table 3**. These numbers are crucial for figuring out how reliable the survey instrument was for this study. The degree to which each item in a test measures the same concept or construct is reflected in Cronbach's alpha coefficient, a commonly used metric for scale reliability. The dependent and independent variables in this study both have Cronbach's alpha values higher than the cutoff value of 0.8. This finding is noteworthy because it indicates a high degree of reliability. Higher values show stronger internal consistency and values above 0.7 are typically regarded as acceptable

in social science research. The measurement tools' dependability is strongly supported by the fact that they achieved values greater than 0.8 in this study. Therefore, the researcher asserts that these tools yield very reliable data, which can be used confidently for thorough study testing and analysis.

Table 3. Reliability statistic-pilot test.

Variables	Cronbach's alpha	N of items
Company performance (DV)	0.923	5
Transformational leadership style (IV1)	0.859	5
Transactional leadership style (IV2)	0.882	5
Authoritative leadership style (IV3)	0.936	5

4.2. Data analysis

4.2.1. Demographic

As shown in **Table 4**, half of the sample consisted of males and half of the sample consisted of females; a total of 399 people from each sex participated. In terms of age groups, the majority of participants were in the 31–40-year-old bracket (37.59 percent or 300 people), followed by the 41–50-year-old bracket (29.20 percent or 233 people), the 20–30-year-old bracket (22.81 percent or 182 people), and finally the 51–60-year-old bracket (10.4 percent or 83 individuals). While most of the participants did not have a bachelor's degree, they did have some college under their belts (51.13 percent or 408 individuals). The next highest level of education was a doctorate, followed by a master's degree (29.82% or 238 people) (19.05 percent or 152 individuals). Frontline managers (44.11 percent or 352 people) and directors (43.7 percent or 349 people) made up a sizable chunk of the participants, with only a small percentage hailing from upper management (12.16 percent or 97 individuals). To conclude, when asked about the size of the organizations they were a part of, most of the participants said that theirs had between one hundred and five hundred employees (47.37 percent or 378 individuals). People working for companies with 100 or fewer employees came next, followed by those with 100–500 employees (25.69 percent or 205 people) (26.94 percent or 215 individuals).

Table 4. Summary of respondents' demographic profile.

Gender	Male	50%	399
	Female	50%	399
Age	20–30	22.81%	182
	31–40	37.59%	300
	41–50	29.20%	233
	51–60	10.4%	83
Education	Degree and under degree	51.13%	408
	Master	29.82%	238
	PHD	19.05%	152

Table 4. (Continued).

Current Position	Frontline manager	44.11%	352
	Director	43.73%	349
	Top management	12.16%	97
Number of employees	Less than 100	25.69%	205
	100–500	47.37%	378
	More than 500	26.94%	215

4.2.2. Factor analysis (dependent and independent variables)

Tables 5 and 6 of the study reveal the suitability of the dataset for factor analysis in the context of a dependent variable (DV) and an independent variable (IV). Table 5 demonstrates that the DV has a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.881, indicating a sufficiently large sample size for the analysis. A KMO value close to 1 suggests that the data patterns are compact and suitable for factor analysis, with the current value of 0.881 indicating a low risk of misleading results. Bartlett’s test of sphericity for the DV yields a significant chi-square value of 2580.424 with 10 degrees of freedom, reinforcing the interrelatedness of variables and their amenability to factor analysis.

Table 5. DV KMO and Bartlett’s test (DV).

KMO and Bartlett’s test		
Kaiser-Meyer-Olkin measure of sampling adequacy		0.881
	Approx. chi-square	2580.424
Bartlett’s test of sphericity	df	10
	Sig.	0.000

Table 6. IV KMO and Bartlett’s test (IV).

KMO and Bartlett’s test		
Kaiser-Meyer-Olkin measure of sampling adequacy		0.931
	Approx. chi-square	8645.187
Bartlett’s test of sphericity	df	105
	Sig.	0.000

In Table 6, the KMO for the IV is 0.931, higher than that for the DV, which underscores the excellent adequacy of the sample for factor analysis. The IV’s Bartlett’s test of sphericity shows an even higher chi-square value of 8645.187 with 105 degrees of freedom, again at a significance level of 0.000. This higher value and greater degree of freedom for the IV compared to the DV suggest a more complex variable structure, making it suitable for a detailed factor analysis.

The study confirms that both the DV and IV are well-suited for factor analysis, with the IV exhibiting greater adequacy than the DV. The significant results from Bartlett’s test of sphericity for both variables indicate substantial correlations among them, crucial for meaningful factor analysis.

4.2.3. Reliability test

The study's Cronbach's alpha values for various variables demonstrate a high level of internal consistency, crucial for ensuring the validity of the research, especially in assessing the impact of different leadership styles on company performance. The dependent variable (DV), company performance, exhibits a Cronbach's alpha of 0.908, indicating very reliable and consistent measurement based on five items. This value, significantly exceeding the satisfactory threshold of 0.7, underscores the reliability of the items in reflecting the company performance construct.

Similarly, the independent variable (IV) transformational leadership style shows a Cronbach's alpha of 0.906, determined through five factors. This high alpha value signifies excellent internal consistency, suggesting that the assessment tools for transformational leadership style are cohesive and effectively capture the essence of the concept. The transactional leadership style, another IV, has a Cronbach's alpha of 0.902, slightly lower than the previous two but still indicating excellent internal consistency. This value is based on five items and confirms the validity and accuracy of the measures used for this leadership style. The highest Cronbach's alpha value observed is 0.926 for the authoritative leadership style IV, based on five items. This exceptionally high value denotes excellent internal consistency, ensuring that the measurement items accurately and consistently capture the key aspects of authoritative leadership.

Overall, the Cronbach's alpha values for each variable in **Table 7**, all above 0.9, indicate very reliable measurements. The items used to measure each variable show high consistency and reliability, essential for the study's validity and its exploration of the effects of various leadership styles on company performance.

Table 7. Reliability test.

Variables	Cronbach's alpha	Number of items
Company performance (DV)	0.908	5
Transformational leadership style (IV)	0.906	5
Transactional leadership style (IV)	0.902	5
Authoritative leadership style (IV)	0.926	5

4.2.4. Multiple regression analysis

Table 8 shows the model's predictions for the dependent variable (DV), and the observed values correlate with those predictions with a correlation coefficient (R) of 0.576. A moderate positive correlation between the dependent variable and the independent variables (transformational, transactional, and authoritative leadership styles) is indicated by an R -value of 0.576, which stands as an indication of the relationship. It implies that the DV also evolves in tandem with these different types of leadership. With a coefficient of determination (R squared) of 0.332, the model adequately accounts for about 33.2% of the variation in the dependent variable. So, it seems like the independent variables can explain a good chunk of the DV's variance. Nevertheless, it implies that the remaining 66.8 percent of the DV variance is due to other factors that were not considered in the model. Compared to R square, the adjusted

R square value of 0.330 is marginally lower. When applied to the population, this adjustment gives a more precise estimate of the variance explained by taking the number of predictors into consideration. With such close values for *R* square and adjusted *R* square, we can see that we have a well-fitting model with sufficient predictors. The average deviation of the observed values from the regression line is represented by the standard error of the estimated 4.06230 value. A basic definition of it is the degree to which the model successfully predicted the DV. With a standard deviation of 4.06230, we can see how far off the predicted values are from the actual ones. In general, lower values are preferable because they show more accurate predictions.

Table 8. Model summary result.

Model summary ^b				
Model	<i>R</i>	<i>R</i> square	Adjusted <i>R</i> square	Std. error of the estimate
1	0.576 ^a	0.332	0.330	4.06230

a. Predictors: (constant), transformational leadership style, transactional leadership style, authoritative leadership style; b. dependent variable: DV.

Table 8 concludes that the DV is moderately predictable according to the leadership styles. The model explains a substantial, though incomplete, portion of the variance in the DV, as indicated by the *R* square value. The closeness of the *R* square and adjusted *R* square values further validates the model’s effectiveness. More than half of the variance in the DV cannot be explained by the current model, which implies the presence of other unaccounted factors.

4.2.5. Multicollinearity

According to the VIF results, the model’s independent variables (IVs) have values ranging from 1.367 to 1.559. A VIF of 1 indicates no interaction, values between 1 and 5 indicate a moderate influence and a VIF of 5 or more indicates a large impact, according to the criterion outlined by Choueiri (2020). Serious multicollinearity concerns are indicated by a VIF greater than 10. The moderate influence of the IVs on each other is suggested by the fact that all of the VIF values in this study are greater than 1 but less than 5. These values show that multicollinearity is not a major issue in the model, which is important. When two or more independent variables in a regression model have a strong linear relationship, it is called multicollinearity. This relationship can affect the estimation of coefficients and weaken the statistical power of the model. So, the model’s estimates are confirmed to be robust by the current VIF results (**Table 9**).

The dependent variable (IV1) is significantly impacted by the transformational leadership style (*t*-value = 6.004, *p*-value < 0.05). An increase in the dependent variable is associated with an increase in the transformational leadership style, as indicated by the positive beta coefficient of 212, which indicates a positive influence relationship. A *t*-value of 4.544 and a *p*-value lower than 0.05 are also shown in IV2, indicating that transactional leadership style has a significant effect on the dependent variable. There is a positive correlation between the dependent variable and higher levels of transactional leadership style, as shown by the positive beta coefficient of 171. There is a highly significant *t*-value of -9.293 for IV3, with a *p*-value lower than

0.05. However, a beta coefficient of -286 points to an inverse relationship of influence. A lower dependent variable appears to be linked to a more authoritative leadership style.

Table 9. Coefficients.

Model	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	95.0% confidence interval for <i>B</i>		Collinearity	
	Beta	Std. error	Beta			Lower bound	Upper bound	Tolerance	VIF
1 (constant)	15.914	1.160		13.716	0.000	13.637	18.192		
IV1	0.212	0.035	0.204	6.004	0.000	0.142	0.281	0.732	1.367
IV2	0.171	0.038	0.161	4.544	0.000	0.097	0.245	0.688	1.496
IV3	-0.286	0.031	-0.337	-9.293	0.000	-0.347	-0.226	0.641	1.559

Coefficients^a: a. Dependent variable: DV.

4.2.6. Hypothesis

A beta coefficient that is near to 1 indicates a strong relationship between the two variables. There is a positive correlation between transformational leadership styles and firm performance, as shown in **Table 10** below, where the *t*-value of this style is 6.004, *p* is 0.000, and beta is 0.204. The significance level is less than 0.05. The data shows a positive correlation between transactional leadership style and company performance ($t = 4.544$, $p = 0.000$, $p < 0.05$ significance level, $\beta = 0.161$). There is a negative correlation between authoritative leadership style and company performance, as indicated by the *t*-value of -0.9293 , a *p*-value of 0.000 (less than the 0.05 significance level), and a beta value of -0.337 .

Table 10. Hypothesis.

Hypothesis	<i>t</i> -value	Beta coefficient	Significance value ($p < 0.05$)	Results
H1: Transformational leadership style influences company performance.	6.004	0.204	0.00	Accepted
H2: Transactional leadership style influences company performance.	4.544	0.161	0.00	Accepted
H3: Authoritative leadership style influences company performance.	-9.293	-0.337	0.00	Accepted

4.3. Discussion

H1: Transformational leadership style positively influences company performance of state-owned enterprises in Northeast China.

The first hypothesis of this paper is that transformational leadership styles affect firm performance. This hypothesis is consistent with the first goal of the study. The literature review found much evidence that transformational leadership style can affect firm performance. For example, transformational leadership styles can affect company performance, thereby increasing employee productivity. The article also mentions that the transformational leadership style helps to improve employees' intrinsic motivation, thereby improving company performance (Khan et al., 2020). From the data point of view, we also verified this conjecture. Pearson correlation can reflect

whether there is a correlation between two groups of variables. We conclude with a Pearson correlation between the dependent variable firm performance and the independent variable transformational leadership style. The Pearson correlation between -1 and 1 and not equal to 1 indicates that there is a relationship between the two sets of data, and the Pearson correlation between transformational leadership style and company performance is 0.432 , indicating that there is a correlation. The correlation between them is 43.2% , and its significance is less than 0.05 .

H2: Transactional leadership style positively influences company performance of state-owned enterprises in Northeast China.

The second hypothesis of this paper is that transactional leadership style affects firm performance. This hypothesis is consistent with the second goal of this paper, which is to examine the effect of transactional leadership style on SOE performance in Northeast China. Starting from the theoretical characteristics, the researchers found that leaders with a transactional leadership style usually stimulate employees' work enthusiasm by informing employees in advance of what kind of efforts and gains they can get, so as to improve work enthusiasm. Punishment to drive subordinate obedience (Jaqua, 2021). Leadership style can indeed affect corporate performance by motivating employees to work. From the experimental data, the Pearson correlation between the dependent variable company performance and the independent variable transactional leadership style is 0.431 , p is less than 0.05 . This indicates that there is a correlation between the variables in this group, with a 43.1% correlation between them.

H3: Authoritative leadership style positively influences company performance of state-owned enterprises in Northeast China.

The third hypothesis of this paper is that authoritative leadership style affects firm performance. Researchers have learned from the literature that leaders with an authoritative leadership style usually believe that they are the masters of the company and have decision-making power in the company. Employees do not need their own opinions but only need to obey the orders of their superiors. In essence, this leadership style is a kind of control, which can lead to a lack of innovation, lack of participation, and recognition in the company, which affects the enthusiasm of employees and leads to the impact on company performance (Karakitapoğlu-Aygün et al., 2019). From the data point of view, the Pearson correlation between the dependent variable company performance and the independent variable authoritative leadership style is -0.519 , which proves that although there is a correlation between the dependent variable and the independent variable, it is a negative correlation. This increase will lead to negative growth in corporate performance, which is enough to prove that our third assumption is correct.

4.4. Recommendations

This research examines the impact of different leadership styles on the performance of state-owned enterprises (SOEs) in Northeast China, highlighting that the effectiveness of these styles can vary, with potentially positive or negative influences on corporate performance. The study emphasizes the benefits of humane leadership approaches, particularly transformational and transactional styles, in enhancing corporate performance.

Transformational leadership, characterized by encouragement, motivation, and innovation stimulation, positively impacts employee job satisfaction and corporate performance. As noted by Ting et al. (2021), this leadership style fosters a strong sense of belonging among employees through corporate culture and other strategies. In contrast, the transactional leadership style, discussed by Jaqua (2021), effectively operationalizes companies and uses rewards and punishments to ensure follower compliance. However, its primary limitation lies in its lack of focus on building relationships and attending to employee emotions, thus neglecting employee feelings compared to other models. The study also critiques authoritative leadership, identifying its negative correlation with corporate performance. This style focused on control and dominated by the leader's vision, tends to suppress employee creativity and enthusiasm, as argued by Karakitapoğlu-Aygün et al. (2019). Authoritative leadership is seen as less conducive to long-term sustainable corporate development due to its over-reliance on a single individual's capabilities and its tendency to produce decisions that can be overly personal and disconnected from the collective strength of the company.

Furthermore, the research contrasts the prevalence of transactional leadership in Chinese private companies with its suitability for SOEs. While this style is common due to its focus on performance improvement, it often overlooks employee creativity and satisfaction. This oversight is attributed to the exploitation of China's demographic dividend. However, the heavy reliance on demographic advantages and the resultant high work pressure can lead to a high turnover rate, which is incompatible with Chinese SOEs' social responsibilities and sustainability goals.

Data from Khan et al. (2020) show that transformational leadership is positively related to company performance. This style enhances employees' intrinsic motivation, leading to increased trust in leaders, higher efficiency, and greater sensitivity in achieving goals. Such leaders are deemed more favorable for the sustainable development of SOEs in Northeast China. In conclusion, the study advocates for leaders of SOEs in Northeast China to adopt more respectful and humane leadership styles. While authoritative and transactional leadership can yield short-term results, they are deemed less effective for long-term corporate performance. Emphasizing humane leadership practices, the research suggests, will improve company performance and ensure the sustainable development of state-owned enterprises in the region.

4.5. Conclusion

The study accomplished the stated research objective to identify the performance of state-owned enterprises in Northeast China is affected by leadership style. Based on state-owned enterprises in Northeast China, a large amount of questionnaire survey data was obtained to study the relationship between three independent variables (transformational leadership style, transactional leadership style, and authoritative leadership style) and the dependent variable (corporate performance). There is a significant relationship. It is concluded that there is a positive correlation between transformational and transactional leadership styles and company performance. At the same time, there is a negative correlation between authoritative leadership style and

performance. The 798 survey report samples come from various state-owned enterprises in Northeast China, lacking a specific understanding of each company, thus ignoring other factors that exist. The researchers believe that companies should have a more specific understanding.

Future research directions should account for several critical considerations to build upon the findings of this study effectively. Firstly, the heterogeneity of state-owned enterprises (SOEs) across different industries must be acknowledged. SOEs encompass a broad spectrum, with some not primarily focused on profit generation. Therefore, future studies should differentiate between profit-oriented and non-profit SOEs to avoid skewed experimental outcomes. It is advisable for future researchers to categorize SOEs accordingly for more targeted investigations. Secondly, the unique operational needs of companies and the demographic nuances within Northeast China warrant attention. As a multi-ethnic region, Northeast China's diverse cultural landscape, including varying religious beliefs and ethnic minority policies, plays a significant role in the operation of SOEs. Researchers should consider these regional and ethnic distinctions to provide a more comprehensive analysis of the impact of leadership styles on company performance. Furthermore, this study faced limitations in data collection, particularly from Heilongjiang and Jilin provinces, due to the smaller number of enterprises compared to Liaoning. This limitation potentially affects the generalizability of the findings. Future studies should aim to gather a more extensive dataset from these regions to enhance the accuracy and reliability of the research outcomes. Lastly, there is a need for deeper exploration into the specific factors through which leadership styles influence company performance. Recognizing that leadership effectiveness is multifaceted, future research should delve into the underlying mechanisms that facilitate the impact of leadership styles on organizational outcomes. This approach will enrich our understanding of the dynamic between leadership and performance within the context of SOEs.

This study aims to shed light on the interplay between leadership style and performance within state-owned enterprises (SOEs), yet it is imperative to acknowledge its limitations. Future research should consider these constraints for a more comprehensive understanding. Firstly, the reliance on online questionnaires, necessitated by logistical constraints, may not fully capture the nuanced perspectives of respondents due to the predefined nature of survey options. This limitation potentially restricts the reflection of respondents' genuine preferences and insights. Future studies could incorporate collaborative interviews to more accurately gauge the subjective views of participants. Secondly, this research does not account for the influence of other potentially significant factors on corporate performance. The data yielded an *R*-squared value of 0.33, suggesting that the independent variables explain approximately 33% of the variance in the dependent variable. This indicates that numerous factors impacting performance were not considered. Addressing this issue requires the inclusion of additional variables to provide a more holistic analysis. Thirdly, the anonymity of the survey process, while necessary for ensuring participant confidentiality, raises concerns about the veracity of the responses. Without verification, there's a risk that the data may not authentically represent the true state of affairs. To mitigate this, future research could employ offline interviews, allowing for a more direct and reliable collection of data. The study predominantly captures

insights from smaller SOEs, due to a limited response from larger enterprises in Northeast China. This skew may not accurately reflect the broader landscape of SOE management practices and performance. Expanding the survey to include a greater number of large SOEs would offer a more balanced view of the sector's dynamics.

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