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When "Soft Budget Constraints" Meet a "Hard League Table": Ownership Nature and Input–Output Efficiency of CBA Clubs—An Empirical Analysis of 18 Clubs from the 2021–2022 to 2025–2026 Seasons

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Abstract

Using soft budget constraint theory as an analytical perspective, this study examines club control and the payroll-performance relationship in Chinese Basketball Association (CBA) clubs, with regular-season win rates representing league-table performance. Player and head-coach payroll is estimated from public contract categories, registration records and player histories for 18 clubs over five seasons from 2021-2022 to 2025-2026, yielding 90 club-season observations. Group comparisons and interaction regressions are used. State-led clubs have approximately 16.4% higher estimated payroll and win rates 11.3 percentage points higher. In model one, an increase of RMB 10 million in estimated payroll is associated with an 11.72-percentage-point higher win rate (t=8.31; club-clustered t=6.54). The baseline control-type interaction is -6.11 (OLS p=0.036; clustered p=0.020), with a 95% confidence interval excluding zero. The state-led group retains a positive payroll slope (7.14; OLS p=0.006; clustered p<0.001). The main level-payroll models support a weaker payroll slope in state-led clubs alongside a positive state-led slope; these are conditional associations. Payroll imputation, uneven estimate coverage across seasons, regular-season-appearance-based proration and reverse causality limit causal interpretation; soft budget constraints and league governance mechanisms require direct testing.

Keywords

ownership, CBA, estimated payroll, regular-season win rate, soft budget constraint, sports economics

1. Introduction

1.1 Research Background

The CBA League has adopted a salary cap mechanism since the 2020-2021 season, which limits the remuneration of both domestic players and foreign players. In such an institutional context, there is still disparity in how resources are allocated among clubs and the level of competitiveness between them.

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1.2 Research Questions

On the topic of state capital involvement in professional sports, it is often considered that state-owned teams have more or less predictable revenue streams but can have efficiency loss on inputs due to lack of focus and lack of incentive restraints. Policy burden theory and soft budget constraints theory suggest that policy goals and the expectation of rescue might change organizational expenditure behavior [1,2], whereas the theory of principal-agent points to agency costs as a result of both inadequate monitoring and incentives [3]. Such theories do make predictions that could be tested, however, they do not directly prove that the state-owned CBA clubs are inefficient.

The present paper will cover three issues: does competitive input show any connection with regular-season win rate? Does the input of the state-led group still have a positive association with win rate when time fixed effects are added? Is the relationship between input and win rate moderated by ownership nature? The study relies on club-season observations and largely offers information regarding associations; regression coefficients cannot be viewed as causal returns to additional spending.

1.3 Research Significance

Policy burden and soft budget constraints theories are primarily concerned with the behavior of firms when operating, but professional sports is a different research environment. The results of competition can be seen throughout a long time and clubs can also aim at commercial income, youth development, the reputation of the city and others. This paper contributes to the empirical literature on the topic by analyzing the connection between ownership and competitive input-output. Since policy burden and governance mechanisms are not directly measured, the outcome does not provide a direct test of the relevant mechanisms.

1.4 Research Sample and Research Design

The paper has examined 18 CBA teams from the 2021-2022 through the 2025-2026 season, which are 90 club-season observations altogether. They can be divided into two categories: six belong to the state-led category and twelve to the private-led category; the list is given in Table 1.

The ownership structure in this paper is actually comparing the nature of the entity that dominates the operation of the team and the input, it does not imply that all the equity in the club should be owned by the state or privately owned. Typically, the classification is determined by the controlling shareholder or the real controller of the operating company; since until the equity transfer, Shandong was run by Shandong Hi-Speed, it is categorized under the controller of the state-owned operator. Sponsors and naming sponsors are not taken as a foundation.

If shareholding ratios can be obtained, there is first the need to identify the type of capital with over half; in case of obscure ratios, annual reports, acquisition announcements, and public registration are used to identify the real controller. To know only the name of the team, the head or governmental backing is not enough to define the ownership. The complex cases, like union shareholding, are described separately.

In this paper, the same state-owned or private grouping is used of the same team in five seasons, which does not necessarily imply that the ownership of the shareholders did not change during the period. In 2021, Shandong Hi-Speed assumed the control of the team, and the relative shares were not registered with the Shangao Club till 2024; the previous period has been classified as state-owned operator. The controlling holder of the Guangzhou Long Lions changed in 2024, and there is evidence of private control both before and after the change, so it stays in the private group.

The input measurement and regression do not involve Zhejiang Chouzhou and Jiangsu Kendia. Their ownership circumstances and the particular causes are presented in Table 2. The results of the present paper apply to only 18 teams listed in Table 1.

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Table 1: Ownership nature and grouping basis of the 18 sample teams

Club and group	Operating entity and related companies	Basis for grouping and shareholder changes	Sources
Beijing Shougang; State-controlled	Beijing Shougang Basketball Club Co., Ltd.; sole shareholder: Shougang Group Co., Ltd.	Shougang Group's 2021 document and 2024 audit report both show that it holds 100% equity in the club.	2021 document; 2024 audit report
Beijing Enterprises; State-controlled	Beijing Enterprises Basketball Club Co., Ltd.; shareholder: Beijing Beikong Culture and Sports Co., Ltd.	The club is wholly owned by Beikong Culture and Sports, and the upper-level shareholder is an SOE; the upper-level shareholder was adjusted in 2024.	Beikong Group materials; club registration; upper shareholder registration
Shanghai Jiushi; State-controlled	Shanghai Jiushi Basketball Club Co., Ltd.	Jiushi Sports disclosed a full acquisition of the club in 2019 and still listed it as a wholly owned subsidiary in 2021.	Shanghai SASAC materials; Jiushi Sports materials
Shandong Hi-Speed; State-operation-led	Shandong Xiwang/Shandong Shangao Basketball Club Co., Ltd.	Shandong Hi-Speed took over team operations in 2021; the original Xiwang-related equity was transferred to Shangao Club in 2024. The first three seasons are grouped by the state-owned operator, which does not mean the equity had been transferred at that time.	2021 takeover news; 2024 equity change; Shangao equity announcement
Qingdao Guoxin; State-controlled	Qingdao Guoxin Haitian Basketball Club Co., Ltd.; related entity: Qingdao Guoxin Eagles Basketball Club Co., Ltd.	Guoxin Group's 2021 and 2023 financial materials list the club as a subsidiary.	2021 financial materials; 2023 financial materials
Shanxi Fenjiu; State-controlled	Shanxi Guotou/Shanxi Fenjiu Professional Basketball Club	The club was transferred into the Fenjiu Group system in 2023; both before and after the change it was state capital.	2018 company announcement; 2023 annual report
Guangdong Hongyuan; Private-controlled	Guangdong Hongyuan Basketball Club Co., Ltd.; sole shareholder: Guangdong Hongyuan Group Co., Ltd.	Hongyuan Group materials in 2022, 2024, and 2025 show that it wholly owns the club and the group is privately controlled.	Club registration; 2022 annual report; 2025 annual report
Liaoning Bengang; Private-controlled	Liaoning Shenyang Sansheng Feibao Basketball Club Co., Ltd.; upper level: Liaoning Basketball (Shenyang) Sports Culture Co., Ltd.	Current registration shows that the club and the upper company are controlled by natural persons; the upper shareholder was adjusted in 2025.	Club registration; shareholder registration; upper company registration
Zhejiang Guangsha; Private-controlled	Zhejiang Guangsha Basketball Club Co., Ltd.; sole shareholder: Zhejiang Hongming Culture and Sports Development Co., Ltd.	Hongming Culture and Sports is the sole shareholder of the club, and the upper company is controlled by natural persons.	Club registration; upper company registration
Xinjiang Guanghui; Private-controlled	Xinjiang Guanghui Basketball Club and related operating entities	The 2025 interim report lists the club as a subsidiary within the Guanghui Group system; the group is controlled by natural persons.	2018 company materials; 2025 interim report
Shenzhen Leopards (Shenzhen Marco Polo) — privately controlled	Shenzhen New Century Basketball Club Co., Ltd.; upper layer: Dongguan New Century Real Estate Development Co., Ltd.	Club shareholders include New Century Real Estate and natural persons; the upper-level real estate company is controlled by natural persons.	Club registration; upper company registration

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Club and group	Operating entity and related companies	Basis for grouping and shareholder changes	Sources
Guangzhou Loong Lions — privately controlled	Loong Lions Basketball Club Co., Ltd.	The 2022 annual report shows control by Zhong Naixiong. After the 2024 shareholder adjustment, Hanyu Consulting became the controlling shareholder; public reports show that it is still indirectly held by natural persons, so it continues to be classified in the private group.	2022 annual report; 2024 shareholder adjustment; subsequent shareholding reports
Nanjing Tongxi Monkey Kings — privately controlled	Nanjing Tongxi Basketball Club Co., Ltd. (joint-stock company); current registered name: Nanjing Tongxi Basketball Club Co., Ltd.	In 2021, Tongxi Group held 99%; the group is controlled by natural persons. Current registration still supports the private classification.	Club registration; group registration; 2021 annual report
Fujian Sturgeons — privately controlled	Fujian Xunxing Basketball Club Co., Ltd.	Announcements in 2021 and 2023 show that Xunxing Group and relatives of the controller held a combined 99%.	2023 company materials; 2021 announcement
Sichuan Blue Whales — privately controlled	Sichuan Jinqiang Blue Whale Basketball Club Co., Ltd.; from 2024, new entity: Sichuan Jincheng Blue Whale Basketball Club Co., Ltd.	The club's operating entity was adjusted in 2024; both before and after the adjustment, there is evidence of control by private shareholders.	Original entity registration; new entity registration; upper shareholder registration
Tianjin Pioneers — privately controlled	Tianjin Ronggang Basketball Club Co., Ltd.	Company disclosures in 2022 and 2025 both support that Rongcheng Group controls the club.	2025 company disclosure; 2022 audit report
Ningbo Fubon — privately controlled	Ningbo Fubon Men's Basketball Club Co., Ltd.	Fubon Group wholly established the current club in 2018; the group's original state-owned equity had previously exited.	Fubon Group materials; group profile
Jilin Northeast Tigers — privately controlled	Jilin Jiutai Rural Commercial Bank Northeast Tiger Basketball Club Co., Ltd.; renamed in 2025: Jilin Northeast Tiger Basketball Club Co., Ltd.	The 2022 and 2024 annual reports and current registration show that the club is held by two natural persons.	Club registration; 2022 annual report; 2024 annual report

Note: Most teams are judged by the equity of the operating company; Shandong is judged by the actual operator in the first three seasons. Guangzhou remains in the private group after changing its controlling shareholder.

Equity judgment references: National Bureau of Statistics classification method for public and non-public controlling economies; National Bureau of Statistics consultation reply on enterprise control (2024).

Table 2: Two teams not included in the sample and the reasons

Team	Ownership situation found	Reason for exclusion	Sources
Zhejiang Chouzhou	Registered shareholders include the Chouzhou Bank Trade Union and Zhejiang College of Sports. Union shareholding cannot be directly equated with bank shareholding.	It is difficult to group directly under the binary state/private classification in this paper; the original sample also did not organize per-person input data for this team.	College materials; club registration
Jiangsu Kendia	Public materials in 2018 show that Kendia Group held 70% and the Provincial Sports Bureau held 30%, providing a basis for enterprise control.	It was initially not sampled because of mixed shareholding. After supplementary checking, this is no longer a sufficient reason for exclusion; however, the existing five seasons do not have per-person input data organized by the same method, so it does not enter the regression.	2018 equity statement; club registration

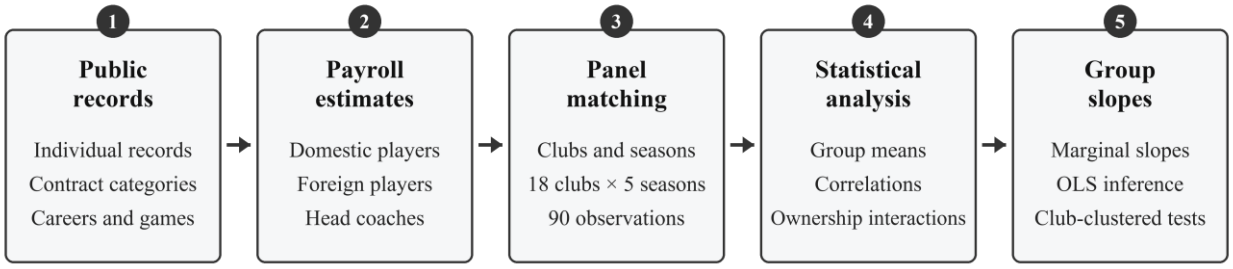
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1.5 Research Content, Methods, and Technical Route

Quantitative analysis comprises descriptive statistics, correlation analysis, and ordinary least squares regressions. The edited five-season data analysis and numerical validation were done in Python; the CR1 club-clustered robust inference was done in Python as well. Statistical inference uses 5% as the primary significance level and also considers coefficients and confidence intervals. In this cycle, input as well as GDP is based on original values and H3 is a supplementary exploratory hypothesis developed following model adjustment.

The sequence of steps in the analysis is to define the indicator of input first, then compare the win rates, perform group comparisons, estimate models, and eventually compute the slopes of groups. The technical path can be found in Figure 1. Per-person valuation complete verification cannot yet be performed without the aid of personnel ledgers and source documents.

Figure 1: Research technical route



Note: Input is personnel cost estimated according to rules; analysis results are interpreted as conditional associations.

1.6 Main Contributions

The paper performs three major functions: the organization of the estimated personnel input of 18 clubs over five seasons based on the same regulations; the comparison of ownership-related performance differences and input slope differences after input control; and the presentation of the OLS and club-clustered inference findings.

2. Literature Review and Theoretical Basis

2.1 Literature Review

2.1.1 Ownership Nature and Firm Efficiency

Shleifer talks about political intervention and managerial incentives in government operations in State versus Private Ownership [4], and Megginson and Netter discuss research on privatization and contrast evidence on firm performance across countries and institutional conditions [5]. Ownership structure and efficiency have been studied in China as well: Liu Xiaoxuan [6] compares the data of the 1995 industrial census; Yao Yang [7] and Bai Chongen et al. [8] investigate the impact of non-state elements and SOE reform, respectively. The studies are primarily concerned with the performance of firms; however, their applicability to competitive performance in professional sports has not been tested together with institution of league and output indicators.

2.1.2 Input and Performance in Professional Sports

Hall et al., in their paper entitled as Testing Causality Between Team Performance and Payroll: The Cases of Major League Baseball and English Soccer, analyze the connection between payroll and performance in Major League Baseball and English soccer [9]. Competitive balance, league design and resource allocation are covered by Szymanski in his article, The Economic Design of Sporting Contests [10]; Késenne's book The Economic Theory of Professional Team Sports: An Analytical Treatment analyzes professional teams' input decisions theoretically [11]. The research forms the basis of payroll-performance analysis, but other factors such as team strength, previous performance and league regulations can influence the relationship too.

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Simmons examines studies on pay, performance, and player mobility in professional sports and explores the differences between public salary information and other player valuation variables [12]. Competitive performance analysis is extended to include payroll scale and wage-to-revenue ratios with data of four European football leagues used by Garcia-del-Barrio and Agnese [13]. Simmons discusses evidence on how closely salary proxies track actual pay, while Garcia-del-Barrio and Agnese analyze payroll scale and financial constraints together.

2.1.3 Ownership and Budget Constraints in Sports Clubs

The paper by Storm and Nielsen explores the concept of soft budget constraints in professional football in the paper, Soft Budget Constraints in Professional Football [14], and the paper by Andreff examines the connection between financial difficulties and the governance structure in French football in French Football: A Financial Crisis Rooted in Weak Governance[15]. These papers indicate that the analysis of the behavior of clubs budgets should be considered within the context of peculiarities of the institutional setting, and ownership features cannot explain all the governance situations. This paper considers ownership as a moderator in the input-performance relationship whereas market competition, league rules and governance arrangements are viewed as potential explanatory variables.

2.1.4 Literature Review

Since the items researched and the indicator definitions are different, the findings of available studies cannot be directly translated into the ownership effects in the CBA. This paper examines the ownership main effect and input interaction term using estimated personnel input data on 18 chosen clubs and presents the results of club-clustered inference to indicate the extent to which the current evidence applies.

2.2 Theoretical Basis

2.2.1 Policy Burden and Soft Budget Constraints

The soft budget constraint problem is treated by Kornai in a systematic way in Economics of Shortage [1], where he deals with both the expectations of organizations of being externally rescued and the associated behavioral implications. The mechanism is further organized by Kornai, Maskin, and Roland in Understanding the Soft Budget Constraint [16]. Lin and Li [2] give the explanation of budget constraints based on the views of policy burden, moral hazard, and rescue arrangements; relevant evidence is given by Lin Yifu, Liu Mingxing, and Zhang Qi [17] based on Chinese companies. The theory examines the ways in which the goals of policy and rescue expectations change behavior; it is not explicitly used to categorize all government-owned firms as ineffective.

2.2.2 Principal–Agent Theory

As demonstrated by Jensen and Meckling in their article, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, interests of owners and agents are not entirely harmonized, and information asymmetry and inadequate monitoring can cause agency costs [3]. Government-owned companies might have more extended principal-agent chains, whereas privately owned companies are also characterized by a division between ownership and management. The present paper will thus be concerned with the difference in incentives based on various ownership contexts rather than concluding that managers are devoid of efficiency incentives simply because of the fact that they are state-owned.

2.2.3 Theoretical Deduction in the CBA Context

Within the CBA league, state-owned clubs can have several goals and receive financial backing, and thus competitive performance might play a less restrictive role in constraining them financially compared to the role played by the same in the case of privately owned clubs. Based on this, it is possible to conclude that at the point of equality between the input levels of the two kinds of clubs, the correlation between the inputs and rates of winning would be different. Nevertheless, state ownership is merely an indirect proxy of this mechanism; the league table, fan supervision, salary limit, and other organizations can also change the choices made by clubs. They may interact with each other. The present paper will test the interaction term between ownership and estimated input and will not directly determine the influence of soft budget constraints, competitive stress, or management professionalism.

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2.3 Research Hypotheses

H2 is the main test that aims at studying the moderating role of ownership in determining the input-win-rate relationship. H3 is an exploratory supplementary hypothesis testing whether the slope of the input of the state-led group is positive.

H1: Estimated competitive input is positively correlated with regular-season win rate. Team personnel resources and competitive ability may jointly affect input valuation and win rate, so this hypothesis tests an association rather than a causal return.

H2: State ownership corresponds to a weaker input–win-rate association. Under model controls, the slope of win rate with respect to input in the state-led group is lower than that in the private group.

H3 (exploratory supplementary proposition): After adding time fixed effects, estimated input in the state-led group remains positively correlated with regular-season win rate.

3. Research Design

3.1 Data Sources

The CBA does not reveal the exact salaries of every player and coach, hence, this paper will estimate competitive input using the publicly available information. The materials are mostly league player registration, contract types, salary cap, standard contract terms, official standings, technical statistics, and signing and appointment reports [18]. Valuations are scored by contract category and past history; they are not directly determined by present season results or owner labels. History can indicate player ability and it might be still related to team performance, and fixed valuation rules cannot remove this endogenous association.

In 2025-2026 season, the regular-season win percentage of Sichuan Jinqiang was zero. This observation is retained in the analysis. The paper does not link the zero win rate to a particular operating condition; causal theories must be backed by other independent sources.

3.2 Variable Measurement

(1) Player salaries (domestic). As the publication of real contract sums is restricted, this paper will use the contract classification and historical information to estimate values on grades: Category D is always set to RMB 6 million; Category C is estimated to fall between RMB 0.5-5 million; Category B is RMB 0.5-1.5 million; Category A is RMB 0.15-0.5 million. It has been referred by this paper to the RMB 6 million individual basic salary ceiling stated in the management regulations of 2022-2023 [19], which has been applied to all Category D players across all sample seasons; but this task is not the literal salary of each and every Category D player. The grading of Category C is national team or All-Star, stable starter, main rotation, and marginal rotation, using the past history and past season performance; in the case where it is hard to differentiate, the middle point of the range is used. The summary of specific amounts was made depending on the per-person assignment and calculation records. Estimation standards are given in Table 3 and an assignment example in Table 6. When a player leaves the team to play abroad, they are dealt with in accordance with the current record convention; this cannot be taken as a conclusion that the club did not incur any salary or contract termination costs during that season.

Table 3: Valuation standards for domestic player salaries

Contract type	Estimation standard	Basis
Category D maximum salary	RMB 6 million	Uniform assignment with reference to the salary ceiling [19]
Category C: national team/All-Star	RMB 4–5 million	National team selection, All-Star appearances
Category C: stable starter	RMB 2–3.5 million	On-court role in the previous season
Category C: main rotation	RMB 1–1.8 million	On-court role in the previous season
Category C: marginal rotation	RMB 0.5–1 million	On-court role in the previous season
Category B protected contract	RMB 0.5–1.5 million	Graded by performance
Category A rookie contract	RMB 0.15–0.5 million	Contract subtype; draft position for A2; prior career information for A1

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(2) Foreign player salaries. Players are classified into various tiers depending on their league experience prior to the acquisition, namely: super tier of USD 3-5 million, high tier of USD 2-3 million, medium tier of USD 1-2 million, and low tier of USD 0.5-1million. Then, the valuation is done based on the corresponding tier depending on the player's history; it is not based on the current-season CBA performance through inverse inference. Foreign player salaries are calculated on a per-appearance basis based on the number of regular-season games played divided by the total number of regular-season games in that season. The appearance ratio is rounded to two decimal places with a minimum of 0.3 and a maximum of 1; playoff performances are excluded. The approach is an approximation to input valuation; the appearances do not match the real payment periods, and mid-season signings, injuries, and rotation plans might also lead to inaccuracies. The constant conversion is applied across all seasons at the rate of RMB 7.2 per USD; this is a constant conversion presumption and not the mean exchange rate of every season. As an illustration, if the approximated annual salary is 1.5 million USD, the regular-season appearances are 13, and there are 42 regular-season games, the proration coefficient would be 0.31 and the prorated value is USD 1.5 million × 0.31 = USD 0.465 million. The signing time, injuries, and rotation arrangements can also impact the regular-season appearances, and this input indicator can still be related to the performance.

(3) Head coach salaries. Four tiers are used to make valuations- renowned, senior, rising, and transitional, with respective ranges of RMB 3-5 million, RMB 1.5-2.5 million, RMB 0.8-1.5 million, and RMB 0.5-0.8 million, respectively, and they are distributed across the number of days served. In case of changing the head coach mid-season, each head coach's estimated salary is prorated by days served and then summed. Since the assistant coaches are not included due to lack of verifiable salary materials, it does not imply that the contribution of the assistant coaches to competitive performance has a negligible value.

(4) Definition of competitive input. Competitive input refers to the total estimated salaries of local players, foreign players, and head coaches. It excludes youth development, stadium costs, travel expenses, victory bonuses, transfer and training costs, and management pay. There are other things that do not have any publicly available information and can also be the joint determinants of performance in the current season; the measure used in this paper includes only a portion of the cost of personnel and not all of the club's spending.

(5) Assignment records and aggregation. This paper maintains per-person assignment and calculation records, which are the fundamental documents to aggregate the club-season input. Table 6 demonstrates that in 2022-2023 season, the types of contracts made by players, their valuation, and the proration of foreign-player appearances have been listed to help understand how the total amount is developed using a case study of Shandong Hi-Speed. The concept of contract categories, history tiers, intra-tier values, and proration conventions must be taken together with the appropriate records because the tiers themselves cannot independently identify the value of every individual. These records can be used to follow the estimation process, however, estimates of salaries do not necessarily match the actual wages.

3.3 Variable Definitions and Model Specification

The dependent variable is the regular-season win rate (%) which is used to measure the season competitive performance. The main explanatory variable is competitive input C (not logged, centered, and divided by 1000), the dummy variable indicating the nature of the dominant entity State(state-led = 1, private-led = 0; Shandong is judged by the operator in the first three seasons), and the interaction term CxState. The interaction term measures the input–win-rate differences in slope between the two groups but it does not directly measure the overall operating efficiency.

The control variables are time fixed effects Year, historical championships prior to the sample period History, and city economic level GDP. Time fixed effects may capture the common changes in institutions and competition formats but cannot remove heterogeneous effects on individual teams.

The history is the total number of CBA championships at the end of the 2020-2021 season, and the economic level of the city is based on 2023 per capita GDP in levels in RMB 10,000. These do not fully represent the team legacy and environmental aspects of the city. Youth training is not added due to the absence of similar information. Definitions of variables are presented in Table 4. In the context of time fixed effects, 2021-2022 season is used as the basis and the values are indicated by dummy variables and respective coefficient terms of the remaining four seasons.

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Table 4: Variable definitions

Variable type	Variable name	Symbol	Measurement
Dependent variable	Competitive performance	Y	Regular-season win rate (%)
Core independent variable	Competitive input	C	Sum of estimated salaries of domestic players, foreign players, and head coaches, measured in RMB 10,000, not logged, minus the sample mean and divided by 1000
Core independent variable	Nature of dominant entity	State	State-led = 1, private-led = 0
Interaction term	Input × nature of dominant entity	C×State	Tests the difference in input–win-rate slopes between the two groups
Control variable	Time fixed effects	Year	Absorbs league-level shocks such as salary cap adjustments and competition-format changes
Control variable	Historical heritage	History	Number of CBA championships by the end of the 2020–2021 season
Control variable	City economic level	GDP	Original 2023 per capita GDP of the city, measured in RMB 10,000

For club i in season t, this paper examines the conditional association between estimated input *Invest* and ownership *State* with win rate Y. The interaction term γ_3 in equation (3) tests the slope difference; if γ_3 is significantly negative, it supports the negative moderation expected by H2. Subscript i denotes club, t denotes season, C_{it} is the centered input divided by 1000 for club i in season t, State $_i$ is the ownership dummy variable, Year $_t$ represents time fixed effects, and ε_{it} is the error term. The complete model with controls is as follows:

$$Y_{it}=\alpha_0+\alpha_1 C_{it}+\lambda_t \text{Year}_t+\varepsilon_{it} \quad (1)$$

$$Y_{it}=\beta_0+\beta_1 C_{it}+\beta_2 \text{State}_i+\lambda_t \text{Year}_t+\varepsilon_{it} \quad (2)$$

$$Y_{it}=\gamma_0+\gamma_1 C_{it}+\gamma_2 \text{ State}_i+\gamma_3 C_{it}\times \text{ State}_i+\phi_1 \text{ History}_i+\phi_2 \text{ GDP}_i+\lambda_t \text{ Year}_t+\varepsilon_{it} \quad (3)$$

Model 1's α_1 corresponds to the overall association in H1; Model 3's $\gamma_1+\gamma_3$ tests the state-led group's input slope, corresponding to H3; Model 3's γ_3 corresponds to H2. A negative γ_3 means that the state-led group's input slope is relatively small; this alone cannot independently confirm that ownership causes efficiency losses. In equation (3), ϕ_1 & ϕ_2 are history and city economic control terms; the version without ϕ is Model 3 (baseline), and the version with ϕ is Model 4.

3.4 Correspondence between Research Hypotheses and Models

Table 5 presents the hypotheses, models, and test objects.

Table 5: Correspondence between research hypotheses and test models

Hypothesis	Content	Test model	Key coefficient	Theoretical expectation	Criterion
H1	Input is positively correlated with performance	Model 1	α_1	Positive	α_1 significantly positive
H2	State-led group has a smaller input slope	Model 3	γ_3	Negative	γ_3 significantly negative
H3	State-led group's input slope remains positive	Model 3	$\gamma_1+\gamma_3$	Positive	$\gamma_1+\gamma_3$ significantly positive (exploratory supplementary proposition)

3.5 Estimation Method and Derivation

The current subsection includes the derivation of the OLS estimator. The following are used to represent model parameters and errors β, γ, and ε, respectively; real estimates and residuals are indicated through computation outcomes and hat characters; ε in equations (6) and (9) refers to the sample residuals that are used

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in computation. In this case, n is the number of observations, k is the number of estimated coefficients (plus the intercept), and both Y and y are used to signify the win-rate vector in the derivation. Errors in models and residuals in samples are not equivalent concepts, sample residuals are derived by subtracting predicted values from observed values.

Step 1: Define the model. Equation (3) in its complete form would have input C, ownership, the interaction term, History, GDP, and four seasonal dummies with a constant term, and there would be 10 such coefficients to be estimated. The basic form will not contain the two control variables at the club level, and it will consist of 8 coefficients.

Step 2: Indicate units. Input is not log-transformed; a unit increase in C means that estimated input increases by RMB 10 million. Win rate Y is measured in percentage, and coefficients are percentage-point differences in win rate. The change relation in the model is

$$\Delta Y=\beta_1 \Delta C=\beta_1 \cdot \frac{\Delta \text{ Invest}}{1000} \tag{4}$$

With an estimated input growth of RMB 10 million, the model forecasts a win-rate gap of around β_1 percentage points. In Model 1, $\beta_1 \approx 11.72$, which means that an increment of RMB 10 million is associated with a win rate higher by about 11.72 percentage points. This explanation can be regarded as a conditional relationship and should not be interpreted as implying that extra spending will always result in the same performance improvement. β_1 in equation (4) denotes the input slope of the associated model; in Model 1, this is equivalent to α_1 . The round does not involve the use of logarithmic transformations, and inputs are measured in RMB 10,000.

Step 3: Centering. Invest is measured in units of RMB 10,000. Subtract the mean of the 90 observations, 5486.444444 (RMB 10,000), from Invest and then divide by 1000, so that the ownership main effect refers to the sample-average input level. Centering aids interpretation of the main effect and interaction term; it does not remove endogeneity or ensure statistical significance.

$$C_{it}=\frac{\text{Invest }_{it}-5486.444444}{1000} \tag{5}$$

Subtracting just the mean will not alter the input slope, interaction coefficient, or fitted values, however it affects the meaning of the intercept and ownership main effect as a reference. γ_1 still is the slope between win rate and input C in the private group; this slope is not valid only at the average input position due to centering.

The fourth step is to write the objective function. The model is expressed as $Y=X\beta+\varepsilon$. Where Y is a 90x1 win-rate vector, and X is the design matrix. The original version of Model 3 has a constant term, an input C, ownership, an interaction term and four season dummies (8 columns) - with the addition of History and GDP, there are 10 columns. Minimizing the residual sum of squares is a property of OLS:

$$\min_{\beta} \text{RSS}=\sum_{it} \varepsilon_{it}^2=\sum_{it} \left(Y_{it}-X_{it}^{'}\beta\right)^2 \tag{6}$$

The next step is to find the extremum. Derive the first derivative with respect to β and equate it to zero:

$$\frac{\partial \text{RSS}}{\partial \beta}=-2X^{'}(y-X\beta)=0 \Rightarrow X^{'}X\beta=X^{'}y \tag{7}$$

$$\hat{\beta}=\left(X^{'}X\right)^{-1}X^{'}y \tag{8}$$

Inputting the data will give us the coefficients. In the base case of Model 3, residual degrees of freedom is n -k = 90-8=82; when the entire Model 4 computation is done, residual degrees of freedom is 90-10=80. Clustered inference also relies on club level degrees of freedom.

Step 6: Standard errors and t-tests. Assuming that errors are uncorrelated and have a constant variance (homoskedastic), the variance-covariance matrix of the least-squares estimator β is $\sigma^2\left(X^{'}X\right)^{-1}$; an estimate of the error variance σ^2 is the residual variance $s^2=\varepsilon^{'}\varepsilon/(n-k)$:

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$$V=s^2\left(X^{'}X\right)^{-1},s^2=\frac{\varepsilon^{'}\varepsilon}{n-k} \tag{9}$$

The standard error of every coefficient is the square root of the diagonal elements of V and t-value = coefficient ÷ standard error:

$$SE\left(\hat{\beta}_j\right)=\left(V_{jj}\right)^{1/2},t=\frac{\hat{\beta}_j}{SE\left(\hat{\beta}_j\right)} \tag{10}$$

Input test in Model 1 is t=11.7156÷1.4103≈8.31(p<0.001), achieving the significance level of 1%. The H2 test deals with the t-value of the interaction term γ_3, that is estimated by a two-sided test. The same club across various seasons can have correlated errors; this paper provides club-clustered robust standard errors based on CR1 small-sample adjustment and 17 degrees of freedom.

Step 7: Find marginal effects. Partially deriving the Model 3 with respect to input C, we obtain the input-output slopes of the two types of clubs as:

$$\frac{\partial Y}{\partial C}=\gamma_1+\gamma_3\cdot \text{State}_i \tag{11}$$

The private-group slope (State =0) is γ_1, and the state-led slope (State =1) is $\gamma_1+\gamma_3$. In order to establish the fact that the state-led slope is positive, the covariance of γ_1 and γ_3 is used to form the standard error:

$$SE\left(\hat{\gamma}_1+\hat{\gamma}_3\right)=\left[\text{Var}\left(\hat{\gamma}_1\right)+\text{Var}\left(\hat{\gamma}_3\right)+2\text{Cov}\left(\hat{\gamma}_1,\hat{\gamma}_3\right)\right]^{1/2} \tag{12}$$

Section 4 applies equations (10)–(12) to the estimation results:

$\gamma_1+\gamma_3=13.2514-6.1118=7.1396$,SE≈2.5291, t≈2.82

Marginal slopes and standard errors of the baseline model in OLS are not causal returns caused by real spending. Equations (12): Var indicates the variance of estimated coefficients, and Cov indicates the covariance of the two estimated coefficients.

The most fundamental version of the clustered covariance is as written below. Equation (13) has g as the club index, G as the total number of clubs, Xg as the row block of the design matrix pertaining to club g, ug as the regression residual vector of club g, and X as the full sample design matrix.

$$\hat{V}_{\text{clust}}=\left(X^{'}X\right)^{-1}\left(\sum_{g=1}^{G}X_g^{'}\hat{u}_g\hat{u}_g^{'}X_g\right)\left(X^{'}X\right)^{-1} \tag{13}$$

The fundamental form of covariance is represented in Equation (13). In practice, it uses the CR1 finite sample correction: multiplication by G/(G-1) and (n-1)/(n-k) with G=18, intervals and t-test use 17 degrees of freedom.

3.6 Assignment Example: Shandong Hi-Speed (2022–2023 Season)

The example of this section explains how the valuation process works in the current ledger using Shandong Hi-Speed as an example in the 2022-2023 season. The estimated input in this season after adding the three parts will be RMB 53.93 million, and more information is presented in Table 6.

Table 6: Assignment details for Shandong Hi-Speed in the 2022–2023 season

No.	Player	Contract Category	Estimated Salary (10k RMB)
1	Jia Cheng	D	600
2	Tao Hanlin	C	450
3	Gao Shiyan	B	150
4	Qiao Wenhan	C	150
5	Liu Guancen	C	150
6	Zhang Hui	C	150
7	Yang Linyi	C	150

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No.	Player	Contract Category	Estimated Salary (10k RMB)
8	Chen Peidong	B	100
9	Jiao Hailong	B	100
10	Wang Wenyu	B	80
11	Zhu Rongzhen	B	80
12	Wen Yanxing	C	80
13	Hou Peizuo	B	60
14	Liu Yi	B	60
15	Ma Xinxin	A1	25
16	Zhao Shihao	A2	25
Foreign Player	Tier	Annual Salary (USD 10k)	Regular-Season Appearances / Conversion / Counted (USD 10k)
Gillenwater	Mid-tier	150	36 games, ×0.86 → 129
Landesberg	High-tier	200	30 games, ×0.71 → 142
Rochestie	Mid-tier	150	13 games, ×0.31 → 46.5
McLemore	Mid-tier	150	7 games, minimum ×0.30 → 45
Brandon Paul	Low-tier	80	6 games, minimum ×0.30 → 24

Note: Foreign-player proration uses regular-season appearances only; playoff appearances are not included. The 2022–2023 regular season had 42 games; the appearance ratio is kept to two decimal places; the proration coefficient is regular-season appearances ÷ 42, with a lower bound of 0.3 and an upper bound of 1. USD is converted at 7.2. The domestic valuation is RMB 24.10 million, the foreign-player amount calculated using the proration factors rounded to two decimal places is RMB 27.828 million, and the head coach's estimated salary is RMB 2.00 million, totaling RMB 53.93 million. These are all research valuations, not verified actual contract expenditures. In this example, direct addition is 2410+2782.8+200=5392.8 in units of RMB 10,000 (RMB 53.928 million), which rounds to RMB 53.93 million.

4. Empirical Results and Analysis

4.1 Descriptive Statistics

The descriptive statistics are presented in Table 7. In the sample, there is no combination where the state-led group will have a higher average input but lower average win rate; however, descriptive means do not control for team strength and other factors, nor do they provide a direct explanation of efficiency.

With the help of the 38, 42, 52, 46, and 42 games played in every season and recalculation of the win rates to whole numbers, the state-led group has total estimated input of 1,816.28 million RMB and scored 763 wins, whereas the private group has total estimated input of 3,121.52 million RMB and scored 1,227 wins. Aggregate input per win is total group input divided by total group wins and differs from the arithmetic average of club-season costs. Cost per observation is extremely vulnerable to low win counts; hence, when Sichuan had no wins, the ratio was not defined for that observation. The present paper has used the aggregate method of reporting group expenses consistently.

Table 7: Comparison of group means between state-led and private clubs (n=90)

Indicator	State-led (30)	Private (60)	State-led − Private
Season competitive input (RMB 10,000)	6054	5203	+16.4%
Regular-season win rate (%)	57.8	46.5	+11.3 pp
Input per win (RMB 10,000/win)	238.0	254.4	−6.4%
Input–output deviation	0.959	1.025	−0.066

The numbers of regular-season games in each season are 38, 42, 52, 46, and 42, respectively; the 2025–2026 season has 42 games [20]. Win rates are restored to the nearest integer win count according to one decimal place. Deviation refers to the share of input in the sample divided by the share of wins in the sample; the denominator is limited to the 18 clubs involved in this study, with 1 as the reference standard. Sichuan's zero-win observation is not used to calculate per-observation cost, but its input and wins are included in the group aggregates.

Table 8 sorts all 90 input valuations in the full sample by amount and divides them into three tiers of 30 observations each; this is not done season by season. The low-input tier contains only 5 state-led observations,

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so it cannot be used to judge stable between-group differences. Absolute amount tiers may also be affected by changes in seasonal expenditure levels; this table is only for descriptive comparison.

Table 8: Average win rate by input tier (%)

Input tier	State-led clubs	Private clubs
High-input tier	62.8	64.2
Medium-input tier	54.7	45.9
Low-input tier	50.6	35.6

The number of club-season observations in each of the high, medium, and low tiers is 30; the numbers of state-led and private observations are 14 and 16, 11 and 19, and 5 and 25, respectively. The tertiles of estimated input in the full sample determine tiers.

Pearson correlation coefficient between input and win rate is 0.591 (t=6.88, p<0.001) in the full sample and 0.435 and 0.605 in the state-led group and the private group respectively. The correlation coefficients are impacted by both the distribution of the inputs of each group and the spread of the win-rates, which means that they cannot be used to compare the efficiencies of the inputs directly. The correlation tests that do not account time fixed effects and club differences are only descriptive ones.

4.2 Regression Results and Hypothesis Tests

The result of Table 9 is three regression baselines (n=90), all with time fixed effects; the input was centered and divided by 1000. The primary test has a significance level of 5 percent and H3 tests the state-led group input slope.

Table 9: Regression results of ownership nature on the input–performance relationship

Variable	Model 1	Model 2	Model 3 (baseline)
C	11.72***(8.31)	11.50***(7.63)	13.25***(7.84)
State	-	1.53(0.41)	3.51(0.93)
C×State	-	-	-6.11**(-2.13)
Time fixed effects	Yes	Yes	Yes
Observations	90	90	90
R^2	0.452	0.453	0.482

*Note: Parentheses contain OLS t-values. C has been centered and divided by 1000; coefficients indicate the percentage-point change in win rate associated with an estimated input increase of RMB 10 million. Club-clustered t-values: Model 1 C=6.54 (p<0.001); Model 2 C=5.18 (p<0.001), State=0.28 (p=0.779); Model 3 C=6.06 (p<0.001), State=0.78 (p=0.447), interaction =−2.56 (p=0.020). Asterisks follow the OLS convention: ***, **, and * correspond to p<0.01, p<0.05, and p<0.1; the 10% level is auxiliary only and is not used as the core conclusion criterion.*

(1) Model 1 tests H1. The input coefficient is α_1=11.72, t=8.31(p<0.001), which is significant at the 1% level; after clustering, t=6.54, which is also statistically significant at the 1% level (t(17)=2.90). A gain in input of RMB 10 million is correlated with an increase in win rate by about 11.72 percentage points, which is consistent with the positive-correlation prediction of H1. This coefficient can be simultaneously interpreted as the ability of the roster, cost decisions, and the manner of valuations, and should not be considered as being causally related to merely spending more money.

(2) Model 2 adds the ownership main effect. The input coefficient is 11.50(t=7.63, clustered t=5.18); the ownership coefficient β_2 is 1.53, t = 0.41 (p = 0.684), clustered t = 0.28 (p = 0.779) which does not achieve the standard level of significance. When both the estimated input and time fixed effects are controlled, there is no significant difference between the two ownership types.

(3) Model 3 tests H2. The private-group input coefficient is γ_1=13.25(t=7.84, clustered t=6.06), which is the slope of win rate on input C; the ownership coefficient γ2=3.51(t=0.93) is not significant. Interaction termγ_3=-6.11,t=-2.13(p=0.036), clustered t=-2.56(p=0.020), is statistically significant at the 5% significance level, which is commonly employed in this paper, and it supports H2 in the reported specification. The state-led group input slope is computed in accordance with equations (11) and (12):

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$$\gamma_1+\gamma_3=13.251421-6.111814=7.139607,$$
$$SE=(2.858558+8.259999+2\times(-2.361193))^{1/2}\approx 2.5291,$$
$$t=2.82$$

The estimated value of the interaction term in the baseline model is -6.11, the state-led group slope is 7.14, and the private group slope is 13.25. The OLS 95 percent confidence interval is about [-11.83,-0.39], and the confidence interval after CR1 clustering adjustment with 17 degrees of freedom is around [-11.14,-1.08]; both do not cover zero. The state-led group slope has t=2.82, p=0.006; clustered t=4.10 (p<0.001), supporting exploratory H3. The state-led group slope is significantly positive, although a positive slope is not sufficient to rule out between-group efficiency differences, nor is a negative interaction term sufficient to conclude that ownership causes efficiency losses.

(4) Model 4 includes control variables. The team strength and city conditions may be influencing the baseline correlation. History is added to Model 3 as the number of historical championships by the end of the 2020 -2021 season and GDP as 2023 per capita GDP in levels. The results are reported in Table 10.

Table 10: Model 4: Regression results with control variables

Variable	Model 3 (baseline)	Model 4 (with History and GDP)
C	13.25***(7.84)	12.81***(7.42)
State	3.51(0.93)	5.98(1.56)
C×State	-6.11**(-2.13)	-5.84**(-2.08)
History	-	1.09(1.64)
GDP	-	-0.63(-1.46)
Time fixed effects	Yes	Yes
Observations	90	90
R^2	0.482	0.518

*Note: Parentheses contain ordinary least squares t-values. Club-clustered robust t-values: C=5.60 (p<0.001), State=1.24 (p=0.230), interaction =−2.58 (p=0.020), History=2.17 (p=0.045), GDP=−1.24 (p=0.232). History is the number of CBA championships by the end of the 2020–2021 season: Guangdong Hongyuan has 11, Beijing Shougang has 3, Liaoning Bengang has 1, Shanghai Jiushi has 1, Xinjiang Guanghui has 1, Sichuan Jinqiang has 1, and all others have 0. GDP is the original 2023 per capita GDP of the club's city, in RMB 10,000. ***, **, and * indicate p<0.01, p<0.05, and p<0.1, respectively; asterisks are marked according to ordinary OLS p-values, which differ from the significance convention of clustered inference.*

The History coefficient is 1.09 (OLS t=1.64, p=0.105); the OLS result does not reach the 5% significance level. CR1 clustered inference gives t=2.17, p=0.045, significant at the 5% level, but this control-variable coefficient should not be interpreted as evidence of the soft budget constraint mechanism. The GDP coefficient is −0.63 (OLS t=−1.46, p=0.149; clustered t=−1.24); no stable city economic association is found. The interaction term is −5.84, t=−2.08, p=0.041, clustered t=−2.58 (p=0.020), supporting H2 at the 5% level. The state-led group's input slope is summed using unrounded coefficients: 12.808272−5.836342=6.971930, approximately 6.97 (clustered standard error 1.8139, t=3.84, p=0.001), still significantly positive, supporting H3. After adding these two controls, the ownership-related results are close to the baseline model, but the possibility of other omitted factors cannot be ruled out. In supplementary checks, a null-imposed wild cluster bootstrap with 9,999 replications and Rademacher weights by club gives p=0.067 for the baseline interaction. With both club and season fixed effects, the interaction is not significant (CR1 p=0.844). Thus, the main-model difference is not stable across these checks.

Table 11 summarizes the hypothesis-test results.

Table 11: Summary of research hypothesis test conclusions

Hypothesis	Test basis	Key result	Conclusion
H1: Input is positively correlated with performance	Model 1 α_1	α_1=11.72,t=8.31,p<0.001; clustered t=6.54,p<0.001	Supports the association expectation
H2: State-led group has a smaller input slope	Model 3 γ_3	γ_3=-6.11,t=-2.13,p=0.036; clustered t=-2.56,p=0.020,95%CI[-11.14,-1.08]	Supported in Models 3 and 4; not stable in sensitivity checks

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H3: State-led group's input slope remains positive	Model 3 $\gamma_1+\gamma_3$	$\gamma_1+\gamma_3$=7.14,t=2.82,p=0.006; clusteredt=4.10,p<0.001	Exploratory result supported in Models 3 and 4

4.3 A Complete Calculation Example: Substituting Shandong Hi-Speed into the Model

This part of the passage describes the substitution calculation in the baseline version of Model 3 with the help of Shandong Hi-Speed in the 2022-2023 season. The estimated input Invest = 5393 RMB 10,000, the real win rate Y = 54.8%, State = 1, and the season is 2022-2023.

The initial stage involves applying the initial input of RMB 53.93 million. The next stage involves taking away the average input of the 90 observations, i. e., 5486.444444, and dividing it by 1000, which gives C=(5393-5486.444444)/1000 = -0.093444444. The last step applies the base version of equation (3) without the History and the city economic controls using the 2021-2022 season as the reference, with an intercept of 62.811620, and a coefficient of -12.622598 on the 2022-2023 season.

$$\hat{Y} = 62.811620 + 13.251421 \times (-0.093444444) + 3.513747 \times 1$$
$$+(-6.111814) \times (-0.093444444 \times 1) + (-12.622598) \times 1 \approx 53.04$$

The forecasted rate of winning is about 53.04 percent, the real win rate is 54.8 percent, and the residual is around +1.76 percentage points.

4.4 Discussion of Results

The interaction term of the baseline model is statistically significant and negative however, the cause of this interaction cannot be directly linked to the ownership mechanism. In contrast to the payroll-performance analysis by Hall et al. [9], the present paper employs the estimates of personnel salaries and introduces the analysis of ownership interactions; coefficient values cannot be directly compared due to differences in data definitions and league conditions. As the discussion of salary proxy data [12] by Simmons suggests, the correspondence between estimated input and actual spending requires independent validation. Theories behind labor markets in professional sports [21] can offer an insight into the resource allocation but cannot be used instead of testing the CBA governance mechanisms. The salary cap, outside control, and professional management might serve as possible explanatory variables, but there is no explicit indicator or reform design in this paper, hence they are mentioned only as future research directions.

It is also possible to find some relatively straightforward differences in the same ownership category. Labels of ownership do not include team history, roster, financial situation, managerial choices, and so on.

5. Conclusions and Recommendations

5.1 Main Conclusions

Based on data from 18 CBA clubs within 5 seasons the paper presents these association findings. In Model 1, an increase of RMB 10 million in estimated input is related to winning by about 11.72 percentage points more often (OLS t=8.31, clustered t=6.54). In Model 3, an increase of RMB 10 million in estimated input corresponds to about 13.25 and 7.14 percentage points of the private group and the state-led group, respectively. The interaction term in the baseline model is significant at 5% (t=-2.13, p=0.036; clustered t=-2.56, p=0.020) and its 95% interval does not contain zero, which supports H2 in the reported specification. Exploratory H3 is supported because the slope of the state-led group is significantly positive (t=2.82, p=0.006; clustered t=4.10, p <0.001). When the History and original GDP are added, the interaction term becomes -5.84 and the state-led group slope is 6.97; both conclusions are statistically significant at the 5% level based on OLS and clustered methods. These results are conditional associations in the main models. The ownership-interaction evidence is sensitive to the supplementary checks.

Since the inputs are based on historical valuation and appearance proration, these findings cannot be extrapolated in general to causal returns to real money spending or confirm that the salary cap or professional management has removed the owner effects.

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5.2 Policy Implications

The regulation of the league should enhance the openness of salaries and financial reporting to ensure that the personnel contribution, income, and other operational expenses are defined in a similar manner. Presuming the protection of contract confidentiality, the league could also publish the ranges of players' and coaches' remuneration as well as personnel and other cost classifications in aggregate terms based on the same definition, and ask teams to detail abnormal changes in expenditures. It will be useful in decreasing misapprehension due to the disparity in statistical definitions. The available evidence prevents making a conclusion about the effectiveness of clubs depending on the ownership labels; the particular impact of the salary cap, financial audit, and governance systems will be seen further after being assessed more directly.

When clubs implement the process of restructuring and performance evaluation, competitive goals, commercial goals, youth training goals, and sporting interests of the general population should be taken into consideration. In practice, these objectives could be treated independently and evaluated as part of annual budget implementation, the development of players, and operating income; government-owned clubs must also describe their objective towards the community and associated financing obligations, whereas privately controlled clubs ought to ensure that input is viable in the long term. Input per win and deviation may be applied to make a descriptive comparison, however due to being susceptible to valuation, aggregation, and zero-win results, they cannot be relied upon as measures of managerial performance or financial risk.

5.3 Research Limitations and Prospects

The shortcomings of this paper can be attributed to the valuation, the coverage, sample, and identification aspects. The estimates use a uniform Category D assignment, career-based tiers, and a fixed exchange rate; foreign-player estimates are prorated by regular-season appearances, which do not equal payment periods and may depend on signing time, injuries, and rotation patterns. The valuations may therefore be related to team performance. The extent to which domestic values are verified also varies between seasons, making input not equal to real spending, and findings should be read carefully. Of the total 18 clubs, just 6 are included in the state-run group and therefore the applicability of the ownership classification is narrow; the outcomes of regression may still be biased by reverse causation, unobserved seasonal variables, or measurement error. The future research must finish per person ledgers and sources, re-estimate foreign-player expenses upon acquiring contracts or pay and service-period information, increase the sample size, and examine what happened before and after the restructuring.

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Conflicts of Interest

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