

Article

# Government Intervention and Capital Market Welfare: A Comprehensive Analysis of "National Team" Shareholding

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**Abstract:** Since the 2015 stock market crash, China's "national team" funds have persistently intervened in the equity market as a stabilizing force. Based on the data of A-share listed companies in Shanghai and Shenzhen from 2015 to 2023, this paper comprehensively evaluates the welfare impact of "national team" shareholding on investors, listed firms and the overall capital market. We find that "national team" shareholding significantly increases investors' dividend yields and improves firms' return on capital, long-term market value and transparency of information disclosure. At the market level, "national team" interventions dampen market volatility and enhance market liquidity and stability. However, while promoting stability, these interventions also increase stock price synchronization and thus reduce pricing efficiency, indicating certain negative side effects. Our research provides empirical evidence on the welfare implications of direct government participation in the stock market and offers policy insights for optimizing the operation of "national team" funds to achieve effective yet efficient intervention.

**Keywords:** "National Team" Shareholding; Government Intervention; Welfare Analysis; Pricing Efficiency; Market Stability

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## 1. Introduction

In contrast to its traditional role as a regulator, the Chinese government has increasingly become a direct participant in the financial market [1]. During the crisis of "thousands of stocks falling" in 2015, the government's emergency intervention via "national team" funds in the secondary market effectively reduced the price volatility, eased the liquidity crisis, boosted market confidence, and maintained short-term market stability [2,3]. The China Securities Regulatory Commission's official report noted the positive role of the "national team" in stabilizing the stock market and stated that these "national team" funds would not withdraw in the coming years, ensuring their stabilizing function remains unchanged. As of 2023, the "national team" funds still hold shares in 924 listed companies with a total market value of 32176.92 billion RMB. Unlike Western countries, where government market intervention is

typically rare and crisis-driven, Chinese government intervention has become regular and normalized across both crisis periods and normal market cycles [1]. Given the government's continuous participation in the market as an investor, it is urgent to systematically assess the overall performance of "national team" shareholding, especially the long-term impact on the welfare of the capital market.

Stiglitz closely links government intervention to social welfare, arguing that the market mechanism is not Pareto-optimal and the optimal goal of government intervention is to maximize social welfare. Wang [1] points out that direct government involvement in transactions affects market prices, and that such intervention should be evaluated from the perspective of consumer welfare rather than over-relying on price-based metrics like realized returns. Brunnermeier et al. [4] construct a theoretical model showing a welfare-maximizing government intervention strategy has two core objectives: first, to reduce the volatility of asset returns, thereby reducing the risk premium to ensure financial stability. The second is to improve market efficiency or the information content of asset prices so as to optimize the allocation of corporate investment. Meanwhile, modern welfare economics has expanded to incorporate multiple values of welfare—encompassing not just efficiency but also equity, employment growth, small business development, etc. [5]. These perspectives provide a broad theoretical framework to examine Chinese government intervention in financial markets from a welfare standpoint.

The capital market's feedback effects play a non-negligible role in welfare changes [6]. Investors, as core participants in the capital market, derive their welfare mainly from cash dividends, which directly affects investor returns and confidence while protecting investor interests [7,8]. Stable and generous dividends provide a predictable income source for investors and bolster market confidence. As an important pillar of the capital market, the high-quality market capitalization of listed companies is not only reflected in share price but also signals a company's growth potential and profitability as well as the fairness and efficiency of the market. The China Securities Regulatory Commission's "Supervisory Guidelines for Listed Companies No. 10—Market Value Management (Draft for Public Comments)" explicitly emphasizes enhancing the quality of listed companies as the basis for improving economic efficiency, profitability and the transparency of information disclosure. Strengthening the quality of listed companies on all fronts, which in turn enhances their profitability and capital operation efficiency, thereby enhancing the welfare of listed companies. Finally, the core objective of the capital market is to provide a stable and efficient investment environment. In this context, we pose three questions: Can the shareholding behavior of the "national team", which is responsible for government functions, enhance investors' dividend income? Can it effectively promote the high-quality development of listed companies? And can it effectively play the stabilizing role of "visible hand" when the market mechanism fails?

This paper focuses on the shareholding behavior of the "national team" and conducts an in-depth analysis of its welfare implications for three types of agents: investors, listed companies, and the overall stock market. We also explore potential unintended consequences of such government intervention. The contributions of this study are threefold: First, we empirically test the welfare-maximization model (reducing asset return volatility and enhancing market efficiency) of government intervention proposed by Brunnermeier et al. [4]. Our evidence shows that "national team" shareholding indeed reduces the volatility of stock

returns and provides liquidity during crises, thereby enhancing overall market stability and welfare. However, this intervention also increases the synchronization of stock price movements and decreases market efficiency, indicating that the Chinese government often prioritizes financial stability over market efficiency. Second, we offer a novel perspective by examining the welfare impact of direct government transactions in the financial market. This contrasts with most prior studies that focus on welfare improvements through indirect interventions such as taxes or subsidies [6,9-11]. By integrating direct government intervention with welfare economics theory, our analysis enriches the understanding of government involvement in markets and provides a referable target for future direct government intervention. Third, we synthesize macro-level and micro-level perspectives in assessing "national team" performance. Existing literature mostly explores the economic consequences of "national team" shareholding from a single dimension of macro-capital market stability [12,13] or micro-enterprise operation [14,15]. By adopting a comprehensive welfare perspective, we evaluate both dimensions simultaneously and provide a more holistic assessment of "national team" behavior, thereby extending the literature on government intervention in financial markets.

The subsequent parts of this paper are organized as follows: Section 2 reviews relevant literature and develops our research hypotheses. Section 3 describes the research design, including data, variables, and empirical methodology. Section 4 presents the empirical results and robustness tests. Section 5 provides further analysis regarding market pricing efficiency. Section 6 concludes with a summary of findings and implications.

## **2. Literature Review and Research Hypotheses**

### *2.1. Impact of "National Team" Shareholding in Existing Literature*

Firm-level (Micro) effects: A number of studies indicate that "national team" funds have governance effects, which can optimize investment decisions, improve corporate investment efficiency, inhibit corporate violations, and reduce corporate risks. In addition, "national team" shareholding has a signaling effect, which reduces information asymmetry and improves the quality of corporate information. Yu and Fang [15] report that "national team" shareholding brings investment and signaling benefits, increasing the external financing of corporations, which positively affects the innovative investment decisions of corporations; Feng and Wen [16] point out that as state-owned institutional investors, "national team" funds actively engage in governance, which lowers internal and external information asymmetry and agency costs, and thus improves corporate investment efficiency; Similarly, Wen and Qiao [17] show that the higher "national team" shareholding ratio, the more obvious the signaling role and governance function, which can help to inhibit corporate violations and the probability of violations; Wen et al. [14] argue that "national team" funds, with value-investing vision and supervisory ability, improve the external information environment of firms and alleviate the financing constraints of firms to effectively reduce corporate risks. Together, these studies reveal the positive effects of "national team" shareholding in improving corporate governance, optimizing investment decisions, and reducing risks.

Market-level (Macro) effects: At the broader market "national team" shareholding has a positive role in reducing stock price volatility, improving stock liquidity, increasing market

confidence and preventing financial risks. Li and Jin [2] show that "national team" shareholding effectively dampen stock price fluctuations by improving the information environment, curbing noise trading, stabilizing investor sentiment, and reducing investor heterogeneity of Beliefs. In addition, these stabilizing effects can spill over, which not only reduces the volatility of the share price of the held company, but also declines for other stocks volatility in the same industry, and the media reports can further amplify this effect [18]; Zhou et al. [19,20] establish a heterogeneous-agent model in which a stabilizer fund (analogous to the "national team" fund) dynamically intervenes to deepen its intervention when actual volatility exceeds a threshold to keep the market within a stable volatility range; Li et al. [12] further show that "national team" funds provide liquidity and boost the market confidence, significantly reduce the tail risk of the stock market during crisis. However, some scholars highlight that such government-induced trading can have negative effects on market efficiency. Huang et al. [21] point out that large-scale trading by "national team" funds may exacerbate stock price deviation from its fundamental value and even create bubble-like conditions; at the same time, it will lead to a significant increase in the synchronization of stock prices and transaction costs, and the information content of stock prices will be significantly reduced [12]. Zhou et al. [22] further showed that "national team" shareholding will exacerbate the herd behavior of institutional investors, but this herd behavior is essentially a pseudo herd.

## 2.2. *Capital Markets and Welfare*

Research explicitly linking capital markets to social welfare is relatively scarce, but two streams of literature provide insight into how financial market policies and mechanisms affect welfare outcomes.

Policy intervention perspective: Huang and Wang [23] argue that market forces alone cannot ensure the effective supply of liquidity, and that potential policy interventions can affect welfare. They find that the government's direct injection of liquidity to alleviate a liquidity shortage can reduce social welfare, whereas coordinating market participants to collectively provide liquidity can enhance welfare; Wang [1] investigates the impact of direct government transactions in financial markets on investor welfare by constructing a general equilibrium framework. When the market mechanism is imperfect, the government doesn't have additional information advantage, its intervention behavior can still enhance investor welfare; when the government intervenes based on public information, investors can trade to offset the market distortion caused by the intervention, thus avoiding the loss of welfare; Zhou et al. [24] developed risk early warning models and argued that assessing and detecting risks in advance can enhance financial stability and protect investors' interests. Brunnermeier et al. [4] include various market participants (investors, noise traders, entrepreneurs and taxpayers) in a welfare model and conclude that the welfare-maximizing government intervention strategy indeed promotes financial stability, but at the expense of some market efficiency; Cui and Ding [25] constructed a DSGE model that includes the wealth effect of the stock market and the steady state dividend level and reflects the characteristics of China's reality, and the study shows that the monetary policy taking the stock price volatility into account can effectively reduce the social welfare loss.

Market mechanism perspective: Shao et al. [26] focus on China's IPO market and argue for the possible collusive overvaluation behavior of securities analysts in the pricing process of IPO

new shares. Analyst overvaluation leads to welfare redistribution effects, issuers obtain more financing revenue, securities firms obtain higher IPO underwriting commissions, and individual investors become the ultimate buyers of IPO wealth redistribution; Zhang and Li [27] comparatively analyze the changes in traders' welfare in a securities market environment with and without market makers, and the total welfare of the society depends on the traders' private value and transaction costs, and the welfare of uninformed traders in a bidding market where informed traders control the price is inferior to that in a market where market makers exist.

### 2.3. Research Hypothesis

The "national team" fund has become a special strategic investor in the capital market by virtue of its unique government background, abundant capital and rich investment experience, and plays a supervisory and governance role on the dividend payment level, capital operation efficiency, long-term market value of enterprises and information disclosure quality of listed companies, which promotes the standardized operation of listed companies and improves the overall quality, thus affecting the welfare of investors and listed companies. The "national team" fund, also known as the Stabilization Fund, plays the function of "Stabilization" on the stock market through reverse operation to iron out market fluctuations, and increases the holdings of stocks when the stock market is going down to cushion the downtrend and stabilize the confidence; when the stock market is rising, the fund will reduce its holdings to prevent the stock market from overheating, thus maintaining the stock price fluctuations in a reasonable range and ensuring the overall stability of the financial market. In this paper, from the "national team" shareholding of listed companies on the regulatory governance effect and the stock market "Stabilization" function of two aspects, the "national team" shareholding on investors' welfare, listed companies' welfare and overall stock market welfare is systematically investigated. As shown in Figure 1, this paper proceeds from the dual perspectives of the supervisory and governance effects of "national team" shareholding on listed companies and its market-stabilizing function in the stock market to systematically investigate the comprehensive impact of "national team" shareholding on investor welfare, listed company welfare, and overall stock market welfare.

**Investor welfare and dividends:** Miller et al. [28] based on the rational and perfect capital market environment, suggests that the market has complete liquidity, investors can "make their own dividends" by selling stocks, and dividends have no effect on investors' wealth. However, real market is not perfect, the existence of transaction costs, information asymmetry and agency problems, the cost of "homemade dividends" is high, so dividends become an important way to give back to investors [29,30]; Dong et al. [31] also confirmed that transaction costs is a key reason for investors to prefer cash dividends through a questionnaire survey. Agency theory further suggests that when ownership is separated from control, managers might misuse free cash flow for personal benefit at the expense of investors, reducing long-term firm value [32]. As a special institutional investor, "national team" funds have incentives and clout to engage in corporate internal governance and mitigate these agency issues. By taking an equity stake, the "national team" can exert pressure on management to inhibit the personal gain and over-investment behaviors triggered by the concentration of power of executives and to prioritize investors returns [29]. At the same time, "national team" funds have the ability to monitor the

behavior of controlling shareholders to prevent tunneling and ensure minority shareholders are protected. The shareholding of "national team" funds effectively alleviates the problems of management agency and controlling shareholder agency, reduces information asymmetry, and promotes the increase of dividend payment by listed companies. In addition, "national team" shareholding not only directly injects capital into the company being held, but also by virtue of its strong information collection and processing capabilities, signals quality to outside investors, and thus help the enterprise to obtain external financing [15]. This can ease the constraints of financing difficulties on dividend payments. Wei and Liu [33] find that firms facing severe financing constraints tend to pay lower dividends, while "national team" funds involvement undoubtedly provides companies with financing facilities and increases the possibility of dividend payment. Accordingly, we propose the first hypothesis:

Hypothesis H1: "National team" shareholding will increase the dividend payout levels of listed companies, thereby boosting cash returns and wealth for investors.

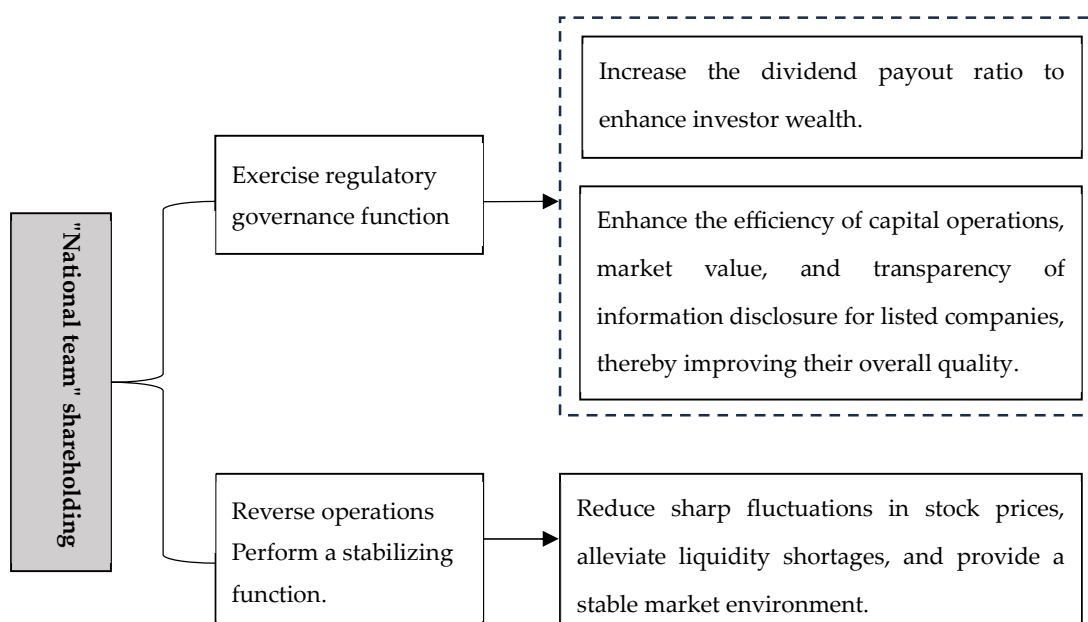


Figure 1. Theoretical Analysis Framework for "national team" shareholding.

**Corporate welfare and firm quality:** The "national team" shareholding is expected to improve the overall quality of the firms it invests in through its governance role. High-quality development of listed companies encompasses efficiency of capital utilization, long-term market value, and high-quality information disclosure, among other factors. With a government background, "national team" funds can optimize the corporate governance structure, correct the mismatch between the internal and external governance mechanisms, optimize resources allocation, and improve the operational efficiency of funds. As an active institutional investor, "national team" funds motivate to enhance firm performance and value [34]. Empirical evidence shows that "national team" shareholding helps to inhibit corporate irregularities [17], reduce corporate risks [14], and improve corporate investment efficiency [16],

all of which contribute to higher long-term corporate value. Li [34] also shows that institutional investors can improve the accounting soundness level of the company to enhance the market value of the company. Moreover, "national team" funds have professional research capabilities, rich investment experience and comprehensive information channels, which can dig out information related to information disclosure, supervise tax avoidance behaviors of listed companies [35], and demand more rigorous and transparent information disclosure. In summary, by exercising regulatory and good governance, "national team" shareholding will enhance various aspects of firm quality, thereby improving the welfare of the firms in the long run. Accordingly, we propose the second hypothesis:

Hypothesis H2: "National team" shareholding will improve the overall quality of listed companies (e.g., capital efficiency, market value, disclosure quality), thereby improving the welfare of companies.

**Market welfare and stability:** The "national team" shareholding has a significant "Stabilization" function. Compared with mature markets, the special institutional background of China's capital market determines the necessity of moderate government intervention in case of market failure [12]. Stock price volatility is not only driven by fundamental company information, but noise trading, investor sentiment and the irrational behaviors are also the triggers of stock price volatility [18]. Under information asymmetry, individual investors are prone to over-trading, herding behavior, and chasing after bulls [12]; these noise-driven trading patterns can amplify market volatility, erupt into market crises in extreme cases [4]. When investor sentiment is high, the demand for risky assets will rise to push stock prices up, which in turn attracts positive feedback investors to join in pushing prices to continue to climb or even away from the fundamental value; when investor sentiment turns pessimistic, a wave of selling is triggered, and positive feedback investors reduce their positions in line with the downtrend of stock prices [36], this self-reinforcing price cycle mechanism leads to the market's inability to self-regulate, triggering sharp price fluctuations. In addition, China's market has up and down limits, a large number of stocks hit the downtrend during the crisis, in order to reduce risk exposure investors turn to sell those stocks that have not reached the downtrend, leading to illiquidity contagion and the spread of the crisis [37]; during the market boom period, the rise in stock prices has given rise to asset price bubbles, which are prone to liquidity crises and depletion once the bubbles burst. The "national team" fund, which is responsible for the government's functions, acts as a "visible hand" to smooth out irrational price fluctuations in the securities market through strict reverse operations [20,38,39]. Increasing stock holdings to cushion the downtrend to prevent liquidity depletion when the stock market falls sharply, and decreasing stock holdings to prevent the stock market from overheating when the stock market rises irrationally, thereby controlling stock price fluctuations within a reasonable range, injecting liquidity into the market and maintaining overall stability. Accordingly, we propose our third hypothesis:

Hypothesis H3: The "national team" shareholding will moderate extreme stock price fluctuations and alleviate market liquidity shortages, providing a stable operating environment for the capital market and thus enhancing overall market welfare.

### 3. Research Design

To verify the research hypotheses, the research design is carried out from three dimensions.

Firstly, focusing on the investor level, we analyze the key indicators of dividend payout to test the impact of "national team" shareholding on investor welfare; secondly, focusing on the listed company level, we comprehensively assess the overall quality of listed companies by examining the efficiency of listed companies' capital operation, long-term market value, and the transparency of information disclosure to test the impact of "national team" shareholding on the welfare of companies; and finally, focusing on the stock market level, we assess the stability and liquidity of the stock market, so as to analyze the impact of the "national team" shareholding on the overall stock market welfare.

### 3.1. Investor Level

Dividend payout level. To investigate Hypothesis H1, we construct a Tobit model based on Zhu and Wang [8] to exclude the interference of truncated data and examine the impact of "national team" shareholding on the dividend payout, so as to explore the impact of "national team" shareholding on the welfare of investors.

$$Payout_{i,t} = \alpha_0 + \alpha_1 Treat_{i,t} + \alpha_2 Ctrl_{i,t} + Ind + Year + \varepsilon_{i,t} \quad (1)$$

$$Payout_{i,t} = \beta_0 + \beta_1 Govern_{i,t} + \beta_2 Ctrl_{i,t} + Ind + Year + \varepsilon_{i,t} \quad (2)$$

The dependent variable *Payout* is measured in two ways: including dividend payout level (*Div*) and dividend payout ratio (*DPR*). Dividend payout level (*Div*) is measured by pre-tax dividend per share from Zhao et al. [40]; and dividend payout ratio (*DPR*) is measured by pre-tax dividend payout per share/ (current value of net profit/end value of paid-in capital for the period) from Huang et al. [41]. The "national team" funds primarily comprise six entities: China Securities Finance Corporation Limited (CSFC), Central Huijin Investment Limited, CSFC asset management plans, investment platforms under the State Administration of Foreign Exchange, CSFC customized funds, and the National Social Security Fund. Referring to the existing study by Li et al. [12], *Treat* is defined as a dummy variable for whether the "national team" holds shares, and *Govern* is the proportion of shares held by the "national team". The proportion of shares held by the "national team"  $Govern > 0$ , *Treat* takes the value of 1, otherwise *Treat* takes the value of 0. This paper controls the asset size, gearing ratio, operating income growth rate, book-to-market ratio, return on net assets, the company's years on the market, the level of cash holdings, equity checks and balances, management shareholding ratio, board of directors' size, and other institutional investors' shareholding ratio. Finally, the paper controls for industry (*Ind*) and time (*Year*) fixed effects and firm-level clustering robust to standard errors.

### 3.2. Listed Company Level

Overall quality of listed companies. To test Hypothesis H2, we design the following model to examine the impact of "national team" shareholding on the overall quality of listed companies.

$$Quality_{i,t} = \alpha_0 + \alpha_1 Treat_{i,t} + \alpha_2 Ctrl_{i,t} + Ind + Year + \varepsilon_{i,t} \quad (3)$$

$$Quality_{i,t} = \beta_0 + \beta_1 Govern_{i,t} + \beta_2 Ctrl_{i,t} + Ind + Year + \varepsilon_{i,t} \quad (4)$$

The dependent variable *Quality* is the overall quality of listed companies. We use three proxies to capture different aspects of firm quality: *ROIC* to measure the efficiency of listed companies' capital operation; *Tobin'q* to measure the long-term value of listed companies; *Rate* to measure the quality of listed company's disclosure. The control variables include: asset size, gearing ratio, operating income growth rate, number of years of listing, cash holding level, shareholding checks and balances, proportion of shares held by the largest shareholder, proportion of shares held by management, size of the board of directors, and proportion of shares held by other institutional investors. The variable quality of disclosure (*Rate*) is modeled using Logit model, and the variables return on invested capital (*ROIC*) and long-term market value of the firm (*Tobin'q*) are modeled using double fixed model.

### 3.3. Stock Market Level

Overall stock market stability. To evaluate Hypothesis H3, we design the following model to examine the impact of "national team" shareholding on the overall stock market.

$$Stable_{i,t} = \alpha_0 + \alpha_1 Treat_{i,t} + \alpha_2 Ctrl_{i,t} + Ind + Year + \varepsilon_{i,t} \quad (5)$$

$$Stable_{i,t} = \beta_0 + \beta_1 Govern_{i,t} + \beta_2 Ctrl_{i,t} + Ind + Year + \varepsilon_{i,t} \quad (6)$$

The dependent variable *Stable*, is the overall stability of the stock market and includes two proxies to measure stock market volatility (*Vol*) and stock market liquidity (*Illiq*). A large body of literature on stock price volatility uses variance or standard deviation to measure stock price volatility. This paper utilizes the standard deviation of stock returns to measure stock price volatility. Regarding the stock market liquidity (*Illiq*) measure, this paper chooses the Amihud illiquidity measure [42]. The arithmetic mean of the monthly Amihud illiquidity measure is used as the annual Amihud illiquidity indicator. Larger values of this variable indicate lower stock liquidity. The control variables include: market capitalization size, stock return, gearing ratio, operating income growth rate, book-to-market ratio, return on net assets, proportion of shares held by the largest shareholder, equity checks and balances, and proportion of shares held by other institutional investors.

### 3.4. Research Sample and Data Sources

The 2015 stock market crash, "national team" funds entered the market on a large scale, and the "national team" funds have not completely withdrawn by 2023. Therefore, our sample consists of the A-share listed companies in Shanghai and Shenzhen from 2015 to 2023. The "national team" fund shareholding, other institutional investors shareholding data from the Wind database, the stock market trading data and listed companies' financial data are from the CSMAR database.

In this paper, the sample data are screened and processed as follows: 1) financial listed companies are excluded; 2) listed companies with special treatment such as ST treatment and delisting during the sample period are excluded; 3) samples with missing data are excluded; 4) in order to avoid the influence of extreme values, all continuous variables are reduced by less than 1% and more than 99% of the interquartile scaling process. Table 1 shows the specific definition of each variable.

**Table 1.** Variable definitions and calculations.

Variable Type	Variable Symbol	Variable Description	
Dependent variable	<i>Div</i>	Cash dividend per share before tax	
	<i>DPR</i>	Dividend per share before tax / (Current value of net profit / Current value of paid-in capital at the end of the period)	
	<i>ROIC</i>	(Net Income + Finance Costs) / (Total Assets - Current Liabilities + Notes Payable + Short-Term Borrowings + Non-Current Liabilities Due Within One Year)	
	<i>Tobin'q</i>	Market Capitalization / Replacement Capital	
	<i>Rate</i>	China Stock Exchange's rating of a company's appraisal 1=excellent, 2=good, 3=qualified, 4=failed	
	<i>Vol</i>	Standard deviation of stock returns to measure overall volatility	
	<i>Illiq</i>	Amihud (2002) Illiquidity Indicators	
Independent variable	<i>Treat</i>	"National team" holdings take 1, otherwise 0	
	<i>Govern</i>	"National team" holdings ratio (% of shares outstanding)	
	Control variable	<i>Size</i>	Log (total assets at the end of the period)
		<i>MC</i>	Log (market capitalization in circulation)
	<i>LEV</i>	Asset-liability ratio, Total liabilities/Total assets	
	<i>Growth</i>	Revenue growth rate, (Operating income for the current quarter - Operating income for the previous quarter) / (Operating income for the previous quarter)	
	<i>BM</i>	Book-to-market ratio, Total assets/Market capitalization	
	<i>ROE</i>	Return on net assets, Net income/Shareholders' equity balance	
	<i>Top1</i>	Shareholding ratio of the first largest shareholder (%)	
	<i>Shrz</i>	Checks and balances on shareholdings, Ratio of shareholding ratio of the company's first largest shareholder to that of the second largest shareholder	
	<i>Age</i>	Number of years listed, Log (current year - year of listing + 1)	
	<i>Cf</i>	Cash holding level, Cash and cash equivalents balance/total assets	
	<i>Mshare</i>	Management's shareholding, Ratio of shareholding ratio of directors, supervisors and senior management to the total number of shares	
	<i>Board</i>	Board size, Number of directors on the board of directors	
	<i>Yield</i>	Stock yield	
	<i>Inst</i>	Shareholding of other institutional investors, Number of shares held by institutional investors other than the "national team" Percentage of outstanding shares	

## 4. Analysis of Empirical Results

### 4.1. Descriptive Statistics Analysis

Table 2 reports the descriptive statistics results of the variables. The mean value of dividend payout level (*Div*) of listed companies is 0.1998, the mean value of dividend payout ratio (*DPR*) is 0.3094; the mean value of return on invested capital (*ROIC*) is 0.0713, the mean value of enterprise value (*Tobin'q*) is 2.0119; the mean value of volatility of earnings (*Vol*) is 0.4508, the mean value of liquidity (*Illiq*) is 0.0386. The mean value of the dummy variable for "national team" fund holdings (*Treat*) is 0.3322, indicating that 33.22% of the stocks in the sample have been held by "national team" fund; The mean value of "national team" fund's shareholding (*Govern*) is 0.8704%, and the maximum value is 9.88%, indicating that the proportion of "national team" fund's shareholding is significantly different among companies. Overall, the distribution characteristics of the variables are consistent with the statistical results of the existing literature.

**Table 2.** Descriptive statistics of variables.

Variable	N	Mean	SD	Min	p50	Max
Div	26199	0.1998	0.2767	0	0.1	1.614
DPR	26199	0.3094	0.2566	0	0.2786	1.0059
ROIC	23508	0.0713	0.0489	-0.0398	0.0609	0.2713
Tobin'q	23508	2.0119	1.2889	0.8278	1.605	9.2423
Rate	23508	1.8777	0.5628	1	2	4
Vol	28222	0.4508	0.1402	0.1966	0.4355	0.8542
Illiq	28222	0.0386	0.1238	0.0002	0.023	13.4002
Treat (%)	28222	0.3322	0.471	0	0	1
Govern	28222	0.9704	1.9278	0	0	9.8800
Size	26199	22.303	1.2898	19.6986	22.0947	26.3369
MC	28222	22.4467	1.0749	20.21	22.3096	25.6337
Lev	28222	0.4176	0.1988	0.0526	0.4099	0.9426
Growth	28222	0.2914	0.6753	-0.8096	0.1178	3.5554
BM	28222	0.622	0.2584	0.112	0.6129	1.205
ROE	28222	0.0515	0.1189	-0.4186	0.0637	0.3306
Top1 (%)	28222	33.067	14.6006	8.3759	30.6606	73.5623
Shrz	28222	7.2781	11.2036	1.004	3.2857	71.4533
Age	26199	1.9848	0.9889	0	2.0794	3.5264
Cf	26199	0.1731	0.1316	0.0012	0.1364	1.2006
Mshare (%)	26199	16.1637	20.4022	0	3.9367	70.0699
Board	26199	8.3473	1.5847	5	9	14
Yield	28222	0.0064	0.0219	-0.0559	0.0049	0.0998
Inst (%)	28222	38.2304	22.8714	0.0528	38.671	85.4218

## 4.2. Analysis of Regression Results

### 4.2.1. Investor Level

Using equations (1) and (2) to test whether "national team" shareholding can increase the cash dividend payouts of listed companies and increase investor returns. The test results are shown in Table 3. The coefficients of "national team" shareholding (*Treat*) and "national team" shareholding proportion (*Govern*) are significantly positive at the 1% level, which indicates that "national team" shareholding promotes the level of cash dividend payout of listed companies and increases investor returns. The "national team" shareholding plays a governance role, improves the transparency of dividend distribution decisions, helps investors form stable return expectations, and plays an important role in fostering the concept of long-term

investment in the capital market [43]. In addition, investors are able to obtain more generous dividend income, which ultimately realizes the financial goal of investor wealth maximization [44], and this positive effect significantly enhances investor welfare. The above result validates the research hypothesis H1 of this paper from the perspective of investors.

**Table 3.** "National team" shareholding and dividend payout levels.

	(1)	(2)	(3)	(4)
	Div	Div	DPR	DPR
Treat	0.0340*** (6.478)		0.0409*** (6.930)	
Govern		0.0063*** (4.338)		0.0075*** (5.129)
Control	Yes	Yes	Yes	Yes
Number	26199	26199	26199	26199
Pseudo R2	0.7911	0.7893	0.1892	0.1872
Cluster	Yes	Yes	Yes	Yes
Year& Indcd	Yes	Yes	Yes	Yes

#### 4.2.2. Listed Company Level

1) "National team" shareholding and capital utilization efficiency of listed companies. Columns (1) and (2) of Table 4 report the regression results of "national team" shareholding on the return on invested capital (*ROIC*) of listed companies. The coefficients of "national team" shareholding (*Treat*) and "national team" shareholding proportion (*Govern*) are significantly positive at the 1% level, indicating that "national team" shareholding increases the return on capital of listed firms, and the higher the shareholding ratio of "national team" funds, the greater the return on capital of listed companies. The study of Feng and Wen [16] shows that "national team" funds play the role of governance and can improve the efficiency of corporate investment. This paper confirms that the "national team" shareholding companies can more effectively use their invested capital to create more profits, prevent capital mismatch, optimize the capital operation process of listed companies, and improve the efficiency of capital operation. In short, this change not only boost the efficiency of capital usage in firms, but also promotes the improvement of their welfare. The result supports the research hypothesis H2 in terms of the efficiency of the firm's capital utilization aspect.

2) "National team" shareholding and listed firm value. Columns (3) and (4) of Table 4 report the results of the regression of "national team" shareholding on firm value (*Tobin'q*). The coefficients of "national team" shareholding (*Treat*) and "national team" shareholding proportion (*Govern*) are both significantly positive at the 1% level, indicating that "national team" shareholding increase the value of listed firms, and the higher the proportion of "national team" shareholding, the greater the long-term value of listed companies. Li et al. [33] argued that a larger shareholding ratio of institutional investors, which has more motivation and ability to participate in corporate governance, can effectively enhance the long-term market value of listed companies. This positive effect makes the long-term value performance of listed companies more robust and contributes to the effective improvement of the overall quality and

comprehensive welfare of the company. The result validates the research hypothesis H2 from the perspective of long-term market value.

3) "National team" shareholding and disclosure quality of listed companies. Columns (5) and (6) of Table 4 report the results of the regression of "national team" shareholding on disclosure quality rating (*Rate*). The regression coefficients of "national team" shareholding (*Treat*) and "national team" shareholding ratio (*Govern*) are both significantly negative at the 1% level, indicating that "national team" shareholding helps to improve the quality of information disclosure of listed companies, and obtains a higher disclosure grade. The shareholding of "national team" actively participates in corporate governance, standardizes information disclosure activities, and establishes a good information environment for enterprises. Improved disclosure not only benefits investors with more reliable information but also reflects an overall improvement in firm quality and governance. The result validates hypothesis H2 from the perspective of information disclosure quality.

**Table 4.** "National team" shareholding and overall quality of listed companies.

	(1)	(2)	(3)	(4)	(5)	(6)
	ROIC	ROIC	Tobin'q	Tobin'q	Rate	Rate
Treat	0.0105*** (9.301)		0.2590*** (9.360)		-0.6092*** (-11.800)	
Govern		0.0023*** (6.785)		0.0480*** (5.549)		-0.1338*** (-10.026)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Number	23508	23508	23508	23508	23508	23508
Pseudo R <sup>2</sup> /R <sup>2</sup>	0.1227	0.1213	0.3131	0.3102	0.1020	0.1007
Cluster	Yes	Yes	Yes	Yes	Yes	Yes
Year & Indcd	Yes	Yes	Yes	Yes	Yes	Yes

#### 4.2.3. Stock Market Level

1) "National team" shareholding and stock market volatility. Columns (1) and (2) of Table 5 report the results of the regression of "national team" shareholding on the volatility of stock returns (*Vol*). The regression coefficients of "national team" shareholding (*Treat*) and "national team" shareholding ratio (*Govern*) are each significantly negative at the 1% level, indicating that "National team" shareholding reduces stock return volatility of stock returns, and the higher the shareholding ratio of "national team" funds, the lower the volatility of stock returns. The "national team" fund can not only slow down the plummet of stock prices in times of crisis, but also inhibit the sharp rise of stock prices in times of market prosperity, thus effectively maintaining the stability of the stock market, creating a stable trading environment for investors and listed companies, and promoting the welfare of the stock market as a whole. This paper verifies the social welfare maximization objective mentioned by Brunnermeier et al. [4] that reduces the volatility of asset returns, reduces the risk premium faced by market participants, and ensures financial stability. The result supports the research hypothesis H3 from the perspective of stock market stability.

2) "National team" shareholding and stock market liquidity. Columns (3) and (4) of Table

5 report the results of the regression of "national team" shareholding on stock liquidity (*Illiq*). The regression coefficients of "national team" shareholding (*Treat*) and "national team" shareholding ratio (*Govern*) are significantly negative at the 5% and 10% levels, respectively, indicating that "national team" shareholding increase stock liquidity, and the higher the proportion of "national team" holdings, the greater the stock liquidity. The "national team" funds provide additional liquidity to the market through trading, which is conducive to mitigating the contagion and spread of the liquidity crisis, thus contributing to an increase in the overall welfare of the stock market. The result confirms the hypothesis H3 from the perspective of stock market liquidity.

**Table 5.** "National team" shareholding and stock market stability.

	(1)	(2)	(3)	(4)
	Vol	Vol	Illiq	Illiq
Treat	-0.0077*** (-4.481)		-0.0043** (-2.064)	
Govern		-0.0036*** (-8.543)		-0.0008* (-1.953)
Control	Yes	Yes	Yes	Yes
Number	28222	28222	28222	28222
R <sup>2</sup>	0.5394	0.5408	0.0496	0.0496
Cluster	Yes	Yes	Yes	Yes
Year & Indcd	Yes	Yes	Yes	Yes

Overall, the empirical results of this paper show that after the intervention of the "national team" fund, investors' returns have increased; the capital utilization efficiency, long-term market value and information disclosure quality of listed companies have significantly improved; at the same time, the stability and liquidity of the stock market have also been significantly enhanced. This evidence is consistent with the hypothesis that government intervention can promote welfare to a certain extent.

### 4.3 Robustness Tests

In order to test the robustness of the results, we conduct a series of robustness tests. For brevity, we present the dividend payment results (investor welfare), similar approaches apply to the other dimensions.

#### 4.3.1. Propensity Score Matching (PSM)

Institutional investors prefer low-risk, highly liquid and high-yield stocks, and the "national team", as a special institutional investor, may converge with general institutional investors in its stockholding preferences. In order to mitigate the endogeneity problems that may arise from the above, we adopt the Propensity Score Matching (PSM) method for robustness testing. Referring to the studies of Wen and Zhang [45], divides the sample into experimental and control groups through the dummy variable of the "national team" shareholding (*Treat*), with the matching covariate as the control variable. Matching is performed using a logit model 1:1 with put-back nearest-neighbor matching, and regressions

are performed based on the matched samples. Columns (1) through (4) of Table 6 show the results of the Propensity Score Matching regression. The regression coefficients of *Treat* and *Govern* are both significantly positive at the 1% level, which is consistent with the main regression results, and further validates the robustness of the previous results.

**Table 6.** Robustness Regression Results.

	(1)	(2)	(3)	(4)	(5)	(6)
	Div	Div	DPR	DPR	Div	DPR
Treat	0.0383*** (5.801)		0.0361*** (5.027)			
Govern		0.0076*** (4.915)		0.0068*** (3.970)		
					0.0187*** (3.148)	0.0213*** (3.890)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Number	10762	10762	10762	10762	26199	26199
Pseudo R <sup>2</sup> / R2	0.7976	0.7960	0.1663	0.1646	0.7873	0.1849
Cluster	Yes	Yes	Yes	Yes	Yes	Yes
Year & Indcd	Yes	Yes	Yes	Yes	Yes	Yes

#### 4.3.2. Placebo Test

In order to exclude the impact of other policy or random factors, we refer to the study of Song et al. [46], firstly, by constructing a randomized placebo treatment group, i.e., 500 random samples in the whole sample to designate firms held by the "national team", and then, using the randomized experimental group, we run the regression on the benchmark model (1) of this paper. If the uplift effect of "national team" holdings on the level of dividend payout is not due to unobservable factors, then we should not observe the same level of treatment effect in the placebo group as in the real group. Figure 2 and 3 presents the results of the Placebo Test, where the distribution of coefficients for 500 randomizations of the experimental group shows a symmetric distribution with a mean close to 0, indicating that these 500 randomly assigned placebo samples have little to no statistically significant treatment effect, whereas the true coefficient values of this paper are significant outliers in the placebo test, suggesting that the effects of this paper are not driven by unobservable, further validating this paper's conclusions.

#### 4.3.3. Incremental Regression

The previous section examined the impact of "national team" shareholding on welfare through the dummy variable for "national team" shareholding and the proportion of "national team" shareholding, but did not analyze the impact of "national team" funds' trading behavior on welfare. Referring to the study of Li and Jin [2], the holding increase behavior of "national team" fund is measured by setting a dummy variable for "national team" holding increase (*dummy*). If the firm is increased by "national team" funds, *dummy* takes 1, otherwise it takes 0. Columns (5) and (6) of Table 6 show the regression results of "national team" funds' increase in holdings. The regression coefficients of *dummy* are significantly positive at the 1% level, which

is consistent with the main regression results. This further validates the robustness of the findings of this paper.

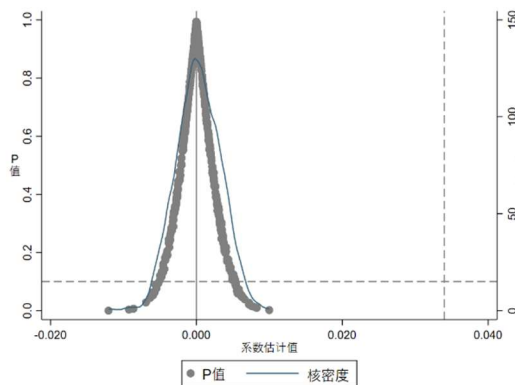


Figure 2. The results of the Placebo Test (Div).

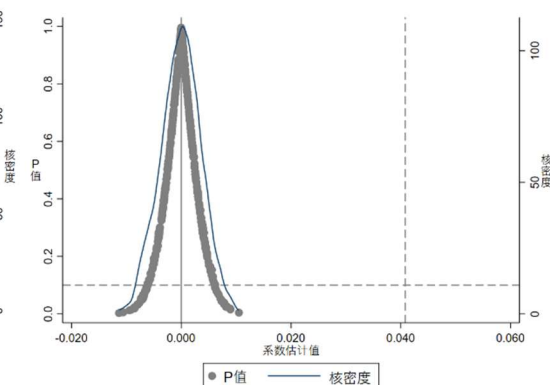


Figure 3. The results of the Placebo Test (DPR).

### 5. Further Analysis

The "national team" shareholding has enhanced the welfare of investors and listed companies to a certain extent, and also constructed a stable development cornerstone for the capital market, which has played a positive role in both crisis and boom times. However, government intervention often brings about distortions in the market price mechanism and reduces pricing efficiency. Morck et al. [47] found that government behavior may weaken arbitrage trading in the market, which in turn reduces the information efficiency of the capital market; Huang et al. [21] pointed out that government intervention may incur long-term costs, including moral hazard, hindering price discovery, increasing uncertainty, and damage government credibility; Brunner Meier et al. [4] further show that intensive government intervention can create noise traders and thus deteriorate market efficiency. In this section, we further analyze the impact of "national team" shareholding on market pricing efficiency. In this paper, stock price synchronization (*SYN*) is used as a key indicator of stock pricing efficiency. Stock price synchronization can be used to reflect the integration of idiosyncratic information of listed companies, and the higher stock price synchronization means the less idiosyncratic information is included in the stock price, and the lower the stock pricing efficiency. This paper draws on Yi et al. [48] to calculate stock price synchronization.

The regression is performed on the daily return data of stocks:

$$R_{i,w,t} = \beta_0 + \beta_1 R_{M,w,t} + \beta_2 R_{M,w-1,t} + \beta_3 R_{I,w,t} + \beta_4 R_{I,w-1,t} + \varepsilon_{i,w,t} \quad (7)$$

Where,  $R_{i,w,t}$  is the yield of stock  $i$  on day  $w$  of year  $t$  considering reinvestment of cash dividends;  $R_{M,w,t}$  is the weighted average yield of market capitalization of all A-share companies in circulation on day  $w$  of year  $t$ ;  $R_{I,w,t}$  is the weighted average yield of market capitalization of other stocks in circulation in the industry in which stock  $i$  is located on day  $w$  of year  $t$  after exclusion of stock  $i$ . The classification of the industry in this paper is based on the classification standard of the China Securities Regulatory Commission in 2012, and  $R^2$  is obtained by calculation. The larger  $R^2$  is, the less company-level information is included in the company's stock price, and the greater the synchronization is.  $R^2$  is logarithmized to obtain the stock price

synchronicity index:

$$SYN_{i,t} = \ln(R_{i,t}^2 / (1 - R_{i,t}^2)) \tag{8}$$

Share price synchronization as the dependent variable is brought into models (1) and (2) for regression analysis, and the results are shown in Table 7. The regression coefficients of "national team" shareholding (*Treat*) and "national team" shareholding ratio (*Govern*) are positive and significant at the 1% level, indicating that "national team" shareholding increases share price synchronization of listed companies. As a fund with government background, the "national team" fund has absolute advantage in acquiring market information and has a demonstration effect in entering the market. The stock holding behavior of "national team" funds will cause market investment participants to follow suit and buy the same stocks, resulting in the stocks held by "national team" funds following the general market "up and down", thus distorting market prices and lowering market pricing efficiency, resulting in a loss of market welfare.

**Table 7.** Synchronization of "national team" holdings with stock prices.

	(1)	(2)
	SYN	SYN
Treat	0.1393*** (7.328)	
Govern		0.0256*** (5.716)
Control	Yes	Yes
Number	23280	23280
R <sup>2</sup>	0.2880	0.2873
Cluster	Yes	Yes
Year & Indcd	Yes	Yes

## 6. Conclusions

This paper systematically studies the welfare effect of "national team" shareholding, and obtains a series of research results. Specifically, "national team" shareholding increases the dividend payment level of listed companies, which directly increases the cash dividend distribution to investors, and then enhances the wealth effect of investors. The "national team" shareholding not only brings direct economic benefits to investors, but also indirectly plays the role of corporate governance, and its shareholding behavior significantly improves the overall quality of listed companies, the return on invested capital increased significantly, the long-term market value of the company to maintain a sound, improved quality of information disclosure. These positive effects together promote the welfare of listed companies. In addition, shareholding by the "national team" plays an important role in stabilizing the market, reducing the drastic fluctuation of stock prices and injecting necessary liquidity into the market in times of crisis; while in times of market prosperity, it can effectively curb the irrationally high stock prices and prevent the bursting of market bubbles. Through this two-way adjustment, the "national team" fund will maintain the stock market volatility within the normal range, create

a stable market environment for investors and listed companies, and safeguard the long-term healthy development of the market. However, the study also pointed out that the stock holding behavior of the "national team" is not without disadvantages, and its stock holding behavior will increase the synchronization of stock prices and reduce the pricing efficiency of the market to a certain extent. Future research should further focus on how to optimize the operation of "national team" funds, with a view to achieving optimal government intervention without reducing market efficiency.

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