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Research Article

Strategic Adjustment Capacity, Sustained Competitive Advantage, and Firm Performance: An Evolutionary Perspective on Bird Flocking and Firm Competition

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Imitating the positioning rules in the bird flocking system, the strategic adjustment capacity is decomposed into three aspects, which are the organizational learning capacity from the top firms, the extent to which firms maintain or rely on the best operational capacity vector in history, and the ability to overcome the disadvantage while maintaining the advantage of the operational capacity vector from the previous years, respectively. Financial vectors are constructed to represent the results of corporate strategic adjustment and listed firms in the China A stock are chosen as the samples. As empirical analysis reveals, there is a positive correlation between the organizational learning capacity from the top firms and the firm performance and a U-shaped relation between the learning capability from the previous best operational capacity vector and the firm performance. However, no significant correlation between the inertia control ability of the current operational capacity vector of the firms and their performance improvement can be observed. This study verifies that the issue of corporate competitiveness and performance can be investigated by utilizing the principles of competition in nature. Moreover, a firm can obtain a sustainable competitive advantage by improving its ability to learn from top firms in the industry.

1. Introduction

The focus of strategic management research is how enterprises utilize appropriate strategies to create and maintain competitive advantages. The research on competition has grown exponentially in recent years. However, Mintzberg et al. noted that research on strategy has been criticized for its overly analytical orientation, upper management bias, lack of attention to action and learning, and neglect of the elements that lead to the creation of strategies [1]. Shrivastava note that research on organizational learning focuses on processes; this has the potential to offer insights into these identified drawbacks [2]. Brockman and Morgan believe that organizational learning is the basis for gaining a sustainable competitive advantage and a key variable in the enhancement of firm performance [3]. Tippins and Sohi state that firms that are able to learn have a better chance of sensing events and trends in the marketplace [4]. Furthermore, some studies provide evidence of a positive relationship between organizational learning and firm performance. For instance, Baker and Sinkula find that learning orientation has a direct effect on firm performance [5]. Ussahawanitchakit uses a cultural measure of learning and obtains similar results [6].

Firms with sustainable competitive advantages typically have two basic characteristics: the first is that they create more economic value than the marginal firms in the industry; the second is that other companies are unable to replicate its strategy. Although the strategy cannot be replicated, these firms are trying to imitate and learn to reduce the difference [7]. It is obvious that learning capacity has an impact on performance, and our paper focuses on how strategic adjustment affects the learning process, sustainable competitive advantage and performance. To be specific, we find that a firm in the corporate competition system is very similar to a bird in the flocking system. The processes of firms pursuing market share and birds pursuing prey are dynamic, and the process of a firm allocating its strategic resources is very similar to the process of a bird positioning itself when pursuing prey. In

fact, the principle of bird flocking has already been applied to an algorithm of artificial intelligence by Dr. Kennedy and Dr. Eberhart, who proposed a population based stochastic optimization technique named particle swarm optimization (PSO) [8]. They note that during bird flocking, the following location is determined by three related factors: the current bird location closest to the food, the closest location that they find in their own search for food, and their current location and speed [9]. It solves a problem by having a population of candidate solutions, here dubbed particles, and moving these particles around in the search-space according to simple mathematical formulae over the particle's position and velocity. Each particle's movement is influenced by its local best known position but is also guided toward the best known positions in the search-space, which are updated as better positions are found by other particles. This is expected to move the swarm toward the best solutions [10]. In this paper, we argue that a firm's performance in the following strategic adjustment is also determined by three factors: the firm's performance of strategic elements it identifies in firms with optimal strategic performance, the firm's performance of strategic elements corresponding to the optimal performance in its own history, and the current firm's performance of strategic elements. The adjustment capacity of firm strategies can be represented by the controlling capacity in these three factors. From the perspective of the dynamic adjustment capacity of firm strategies, we choose some indicators in the financial statement that reflect the firm's abilities in asset operation, earning profits, and cash flow management to measure the results of strategy adjustment [11]. We use the return on assets (ROA) to measure the firm's performance. After testing these indices that have a significant impact on firm performance and comparing them with the system of bird flocking, the strategic adjustment capacity displayed can be obtained from these three aspects. The relationship between the adjustment capacity of a firm's strategies and its performance can then be tested. Finally, the adjustment capacity of firm strategies can be evaluated.

Just like the fittest organisms surviving in the ecological environment, the business entities also strive for survival and development through constantly improving their sustainable competitiveness in the business ecological environment. Enterprises often need to face the problem of "how better decision-making helps to improve sustainability," seek the "sustainable business and development" mode, and explore the "sustainable leadership and management." All of the above concern the topmost strategic planning issues of enterprises, so the ability to make strategic adjustments according to the internal and external environment is the key for enterprises to stay ahead and obtain industry performance. This paper takes the enterprise strategy adjustment ability as the entry point and answers the above questions through the bird flocking and firm competition, specifically, including how to divide the dimension of enterprise strategic adjustment abilities, how to quantify the enterprise strategic adjustment abilities, and what the impacts of strategy adjustment abilities are at different dimensions on corporate performance [12]. On this basis, the article aims to build the core competitiveness of enterprises and provide a decision-making basis for sustainable advantages. However, in times of disruptive change within different industries, this competitiveness could be drastically reduced, so the disruptive companies are not in the scope of this research.

This paper contributes to the research surrounding the organizational learning uncovered in prior research. Most prior research is focused on exploring the multiple dimensions of organizational learning ability from the inside of an enterprise to build an organizational learning ability evaluation system and evaluation model and then discusses the relationship between organizational learning ability and performance, such as the 6P-1B model of learning organization [13], Multi-group Structural Equation Modeling Approach [14], and Capability Model [15]. These studies take the perspective of individual enterprises to determine their ability to learn. They emphasize the evaluation of the learning process, and most of the qualitative analysis is based on questionnaires. Furthermore, most of these studies are static studies, which produce results only at a certain time point in the evaluation of enterprise organizational learning abilities. Our paper studies the dynamic adjustment of strategy and the ability of organizational learning in a certain period from the enterprise's external performance. Since the data we use are financial data from the financial statements, this paper proposes a quantitative analysis method to evaluate the strategy adjustment capacity.

Two points should be made in relating this paper's findings to other research. First, our focus is different. On the one hand, we emphasize the effect of organizational learning, which reflects the ability of organizational learning; on the other hand, for the ability of the enterprise strategy decision, we focus on the enterprise's learning strategies and learning ability in situations of market competition, based on which we can evaluate the enterprise's strategic adjustment ability and study the relationship between organizational learning and performance. Second, the strategic adjustment and organizational learning are posited to be similar to the bird flocking process. Furthermore, the purpose of this study is not only to evaluate the enterprise learning ability but also to guide firms on how to learn and to promote the strategic adjustment capacity to obtain better performance.

The remainder of the paper is organized as follows: Section 2 is the literature review; Section 3 introduces the vector of strategic adjustment, the concept of the strategic adjustment capacity, and the measurement of related variables; Section 4 explains the data and the way to compute the strategic adjustment capacity, followed by the empirical results; Section 5 discusses managerial implications; and Section 6 summarizes and concludes the paper.

2. Literature Review

The way that firm strategy influences the performance has received great attention in recent years. Firm strategy expresses a basic idea of how to reach firm's objectives. Financial strategy, as a functional strategy, plays an important role in firm strategy. There are some companies' turnover decreasing because of having no strategic financial management [16]. However, the definition of financial strategy is somewhat

vague and quantitative analyses of the financial strategy are almost focused on the direct influence of working capital management on corporate profitability [17–19], which proved that working capital management has a significant impact on both profitability and liquidity in different countries [20, 21].

The management of working capital is defined as the "management of current assets and current liabilities, and financing these current assets" [20]. Following this definition, some researchers studied the impact of proper or optimal inventory management; others studied the management of accounts receivables. Eljelly found that there was a negative relationship between profitability and liquidity indicators, such as current ratio and cash gap in the Saudi sample examined [22]. Using correlation and regression tests, Deloof found a significant negative relationship between gross operating income and the number of days accounts receivable, inventories, and accounts payable of Belgian firms [21]. Nazir and Afza found a negative relationship between the profitability of firms and the degree of aggressiveness of working capital investment and financing policies from a sample of 204 nonfinancial firms listed on Karachi Stock Exchange (KSE) for the period 1998–2005 [23]. All of these studies are trying to postulate an optimal way policy that leads to profit maximization [24–27], but almost none of them try to find the optimal construction of working capital by viewing the working capital management as a firm's financial strategy and viewing the optimization configuration process of working capital as an organizational learning process.

Despite a large body of studies about organizational learning, only a few studies focus on the organizational learning process. Goold and Pascale show that organizational learning process is probably not in order, and the strategic adjustment and organizational learning are described as an emergent, trial-and-error, and even random process [28, 29]. Tippins and Sohi show that the five stages they distinguish within the organizational learning process (information acquisition, information dissemination, shared interpretation, declarative memory, and procedural memory) have a positive effect on firm performance [4]. Darroch and McNaughton provide evidence that the entire process of organizational learning produces better performance [30]. Organizational learning research has largely remained disconnected from strategy [31, 32]. There are two major drawbacks. The first shortcoming is a conceptualization of organizational learning that is too narrow. Additionally, most previous research considered individual enterprises and did not investigate the effects that competition against other firms has on the industry. The second shortcoming is that even in cases where organizational learning has been applied to strategic renewal, researchers have stopped testing the related data. As Crossan and Berdrow asked, how does organizational learning explain the phenomenon of strategic renewal? [33].

In contrast to neoclassical economic models that assume that individuals hold preferences independently of others, there are growing bodies of research demonstrating that preferences are often interdependent and based upon relative comparisons. Wilson and Kniffin developed and presented a series of simulation models that highlight the fact that evolutionary change in human groups is not tied to genetic change and that once one allows for "learning" in evolutionary models, then (human) groups can change at a great speed [34]. After this, a wide array of evolutionary perspectives—drawn mainly from studies of nonhuman species—are organized, while focusing attention on understanding the nature of altruism by Wilson and Kniffin [35]. Kniffin considers the sensitivity of individuals to their relative salary standing (e.g., in relation to coworkers) using the concept of relative fitness that is central to evolutionary studies of all types of human and nonhuman species [36]. Following this point of view, to fill the gap identified by Crossan and Berdrow in organizational learning research [33], this paper aims to understand the specific process of strategic adjustment and uses a quantitative analysis to investigate the relationship between the capacity of strategic adjustment and firm performance from the perspective of the complex adaptive system (CAS) [37].

The complex adaptive system (CAS) proposed in 1994 provided the fundamental theories and methods for the study of the adaptation process of a complicated system [37]. The main feature is that members in the system (called subjects) can be adaptive, meaning that they can communicate with their environment and other subjects and learn or accumulate experiences to change their own structure or behavior on the basis of the communicative process. The transformation or evolution of the whole system includes the generation of the new hierarchy, the emergence of divergence and diversity, and the occurrence of new themes. Likewise, the system of corporate competition has these features [38]. First, as subjects, firms are active and dynamic. Second, firm subjects and the environment or other firm subjects influence and interact with one another, which can be considered a major drive for development and change in society and in an economy. Finally, the whole system may be affected by certain random factors. To obtain better performance, firms will adjust strategically according to the industrial environment and their own development status. From the perspective of the resource-based view (RBV), the strategic adjustment starts with changes in resource allocation [39]. Firms will optimize the allocation proportion of different resources or adjust the investment quantities of overall resources, and thus the resource allocation of firms will be integrated to generate better strategic performance [40]. From the perspective of strategic adjustment and implementation outcomes, the effects of this resource allocation will be ultimately transferred to the operational capacity, namely, the changes in the operational capacity vectors [41]. As a result, the strategic adjustment capacity can be defined as the capacity to achieve the optimal operational capacity vector, and the system of corporate competition can be viewed as a sophisticated system of adaptation.

Inspired from natural biological system, we can do research on corporate competition by bionic studies of the bird flocking [42]. Assume that there is only one type of food available in a certain region and a flock of birds are searching for food randomly. At the beginning, all the birds do not know the location of the food but the distance of the food. The simple and effective strategy for the birds to find the food is to search for the birds that are in neighboring areas

which are close to the food at that moment and then approach them. By repeating the same processes, the birds are able to search for the food more efficiently. Like the bird flocking, firms also do not know what type of corporate strategy is the best when seeking better performance [43]. Also, in most industries, firms tend to learn from their competitor enterprises that have optimal performance (i.e., the collection of operational capacities that can reflect the formation of the strategic implementation within a period of time) [44]. Degeus notes that organizational learning may be the only sustainable competitive advantage [45]. Subsequently, like bird flocking, firms adjust their own strategic orientation and the allocation of strategic resources to obtain the operational capacity vector of maximum strategic performance.

3. Methodology

3.1. Vector of Operational Capacity. In market competition, firms improve their own competitiveness continuously and seek the best profits by adjusting strategies. These strategies may include reducing costs, differentiating, focusing, or diversifying products or services. While the strategies adopted are varied and sophisticated, the ultimate aim of these strategies is to increase the profit and operational capacity of the firm and to seize development opportunities brought by external environment changes. Therefore, we contend that the direct objective of firm strategic adjustment is to increase its operational capacity. From the perspective of financial analysis and working capital management, some indices can represent the profit and operational and cash controlling capacities of firms [46]. We first conduct a statistical analysis of operational capacity and firm strategic performance to construct the vector of operational capacity.

In terms of the profit-making capacity of firms, the net profit margin (NPM) represents the net profit brought by sales. Through NPM, firms can expand sales and strive to improve operational management at the same time, to increase profits and obtain better strategic performance [47]. The operating cost ratio (OCR) represents the cost-controlling capacity of firms. The lower the OCR is, the stronger the cost-controlling capacity is. In other words, firms are more likely to obtain better performance with a low OCR [48]. The proportion of selling expenses, general and administrative expenses, and financial expenses (SGF) represents the control ability of firms in sales, administration, and finance. A low SGF shows that the selling and administrative efficiency and the financial strength of a firm are stronger. These firms are more likely to increase performance [49]. Therefore, we present our first hypothesis:

(H1) The net profit margin of firms is positively correlated with its performance measured by ROA.

(H2) The operating cost ratio is negatively correlated with its performance measured by ROA.

(H3) The proportion of selling expenses, general and administrative expenses, and financial expenses is negatively correlated with its performance measured by ROA.

In terms of cash holdings, firms usually hold a certain amount of cash to maintain daily operations and seize some investment opportunities. However, holding too much cash suggests that this part of the resources is not involved in the profit-making of firms to generate corresponding performance [50]. As a result, the fourth hypothesis is made for CHR as follows:

(H4) The cash holding ratio (CHR) is negatively correlated with performance measured by ROA.

In the operational process, the turnover capability can affect the efficiency of value creation. We considered the most important indicators of short-term asset turnover capability, such as inventory turnover, liquid asset turnover, and fixed asset turnover [51]. Therefore, we present our next three hypotheses:

(H5) A firm's inventory turnover ratio and accounts receivable turnover ratio are positively correlated with its performance as measured by ROA.

(H6) A firm's liquid asset turnover ratio is positively correlated with its performance measured by ROA.

(H7) A firm's fixed asset turnover ratio is positively correlated with its performance measured by ROA.

The panel data methodology is deployed to capture the effects of these indices of operational capacity on performance measured by ROA. In line with the previous hypotheses, we take the firm size ($\text{Size}_{i,t}$) and the lagged ROA ($\text{ROA}_{i,t-1}$) as control variables, and the seven different panel data models are estimated:

$$\text{ROA}_{i,t} = \alpha_1 \text{NPM}_{i,t} + \beta_1 \text{Size}_{i,t} + \gamma_1 \text{ROA}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t} \quad (1)$$

$$\text{ROA}_{i,t} = \alpha_2 \text{OCR}_{i,t} + \beta_2 \text{Size}_{i,t} + \gamma_2 \text{ROA}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t} \quad (2)$$

$$\text{ROA}_{i,t} = \alpha_3 \text{SGFR}_{i,t} + \beta_3 \text{Size}_{i,t} + \gamma_3 \text{ROA}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t} \quad (3)$$

$$\text{ROA}_{i,t} = \alpha_4 \text{CHR}_{i,t} + \beta_4 \text{Size}_{i,t} + \gamma_4 \text{ROA}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t} \quad (4)$$

$$\text{ROA}_{i,t} = \alpha_5 \text{IT}_{i,t} + \beta_5 \text{Size}_{i,t} + \gamma_5 \text{ROA}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t} \quad (5)$$

$$\text{ROA}_{i,t} = \alpha_6 \text{LT}_{i,t} + \beta_6 \text{Size}_{i,t} + \gamma_6 \text{ROA}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t} \quad (6)$$

$$\text{ROA}_{i,t} = \alpha_7 \text{FT}_{i,t} + \beta_7 \text{Size}_{i,t} + \gamma_7 \text{ROA}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t}, \quad (7)$$

where μ_i controlled the firm's individual effects, η_t controlled the time effects, and $\varepsilon_{i,t}$ were the error terms.

After the effects of these variables are confirmed, we can use them to construct the operational capacity vector as follows:

$$EC_{i,t} = \begin{bmatrix} \mathrm{NPM}_{i,t} \\ \mathrm{OCR}_{i,t} \\ \mathrm{SGFR}_{i,t} \\ \mathrm{CHR}_{i,t} \\ \mathrm{IT}_{i,t} \\ \mathrm{LT}_{i,t} \\ \mathrm{FT}_{i,t} \end{bmatrix}. \quad (8)$$

Based on this definition, we can measure the operational capacity and study the correlation between operational capacity and firm performance. The details are presented in the next section.

3.2. Strategic Adjustment Capacity. Based on the principle of the bird flocking system, the factors affecting the following location of a bird include the location of the bird closest to the food in the current flock of birds, the location closest to the food during the search for the food, and the current location of the bird, as illustrated in

$$X_{it+1} = \overrightarrow{\omega}_{i1} Y_{tI\_\mathrm{best}} + \overrightarrow{\omega}_{i2} Z_{iT\_\mathrm{best}} + \overrightarrow{\omega}_{i3} X_{it}, \quad (9)$$

where X_{it+1} is the location vector of the bird at the moment of $t + 1$; Y_{tI_best} is the location vector of the bird closest to the food among the individual birds at moment t; Z_{iT_best} is the location vector closest to the food by the bird, which searches by itself from the start to moment t; and X_{it} is the location vector of the bird in its current place. $\overrightarrow{\omega}_{i1}$, $\overrightarrow{\omega}_{i2}$, and $\overrightarrow{\omega}_{i3}$ represent the capacity of the bird, which evaluates another bird in the flock that is closest to the food, memorizes the location closest to the food itself, and controls the current location, respectively.

Similar to the bird flocking system, firms are able to adjust their operational capacity on the basis of the operational capacity of their rivals, the status of their operational capacity in obtaining optimal performance in their own development process, and their current capacity to increase strategic performance. The process can be shown in

$$EC_{ijt+1} = \omega_{ij1} EC_{tjI_i\_\mathrm{best}} + \omega_{ij2} EC_{ijT_t\_\mathrm{best}} + \omega_{ij3} EC_{ijt}, \quad (10)$$

where EC_{ijt+1} is the value of firm i's financial index j at the year $t + 1$. From our viewpoint, this variable was determined by three relative aspects: $EC_{tjI_i\_\mathrm{best}}$ is the value of index j in the operational capacity vector of firm i in industry I_i that was obtained from optimal strategic performance at moment t; $EC_{ijT_t\_\mathrm{best}}$ is the value of index j in the operational capacity vector of firm i that is obtained from optimal performance until moment t during the investigation period T_t; and EC_{ijt} is the value of index j in the current operational capacity vector of firm i. ω_{ij1} is the capacity to learn from firms with an optimal operational capacity vector when firm i adjusts the value of index j of the operational capacity vector; ω_{ij2} is the weighting of the value of index j of the operational capacity vector in its own record of the optimal performance, which is obtained when firm i adjusts the value of index j in the operational capacity vector; and ω_{ij3} refers to the inertial control ability of the value of index j of the current operational capacity vector when firm i adjusts the value of index j in the operational capacity vector.

The studies of the relationship between the strategic adjustment capacity and performance can be developed in these three perspectives mentioned above. The first aspect of the strategic adjustment capacity is organizational learning from firms with the best performance, labeled as C_1. Grahovac and Miller note that the interaction between resource value and the cost of imitation is complex and affected by the number of firms in the industry [52]. We argue that learning from the firms with the best performance enables firms to narrow the gap with other firms with the best operational capacity, after which the gap of strategic performance is also narrowed. Hence, it can be inferred that the improved ability to learn from firms with the best performance will facilitate a range of performance improvement, as illustrated in the following hypothesis:

> (H8) There is a positive correlation between organizational learning capacity in firms with the optimal operational capacity vector and the future performance improvement.

A second aspect of the strategic adjustment capacity is the extent to which firms maintain or rely on the best operational capacity vector in history, labeled as C_2. When the weight of the best operational capacity vector is determined, if firms think their best performance is not satisfactory, they will reduce the weight and support innovative strategies. They will explore the optimal operational capacity vector that fits them to improve their performance. Otherwise, they will allocate more weight to allow the firm to accumulate competitive advantages for better performance. As a result, we argue that lower dependence on the optimal operational capacity vector will benefit innovation for better performance. As the dependence increases, the effect of improving performance will decrease until the dependence achieves a certain level. This will benefit the firms and allow them to build the competitive edge and improve the strategic performance, namely:

> (H9) There is a negative correlation between the degree to which the firms rely on the best operational capacity and the future performance improvement; however, as the dependence exceeds a certain level, its correlation with future performance improvement will be positive.

A final aspect of the strategic adjustment capacity is the inertia control ability, labeled as C_3. The inertia control ability represents the ability to change the disadvantage of the operational capacity vector from the previous year or maintain the advantage of the operational capacity vector in the previous year. If firms have better inertia control ability, they tend to increase their performance, namely,

Table 1: Variable names and definitions.

Variable	Definition	
Return on asset (ROA)	The ratio of net income to total assets	Knauer and Wöhrmann (2013) [46]
ΔROA	$\Delta\text{ROA}_i = \text{ROA}_{i,2015} - \text{ROA}_{i,2014}$	Knauer and Wöhrmann (2013) [46]
Net profit margin (NPM)	Net margin/operating income	Baños-Caballero et al. (2014) [47]
Operating cost ratio (OCR)	Operating cost/operating income	Salman et al. (2014) [48]
Selling, administrative and financial expense ratio (SGFR)	(Operating expenses + administrative expenses + financial expenses)/operating income	Afrifa (2016) [49]
Cash holding rate (CHR)	Monetary capital/assets total	Aktas et al. (2015) [50]
Inventory turnover (IT)	Operating cost/((initial inventory net + final inventory Ne)/2)	Tran et al. (2017) [51]
Liquid asset turnover (LT)	Operating cost/((initial mobile assets + final mobile assets)/2)	Tranet al. (2017) [51]
Fix asset turnover (FT)	Operating cost/((initial fixed assets + final fixed assets)/2)	Tran et al. (2017) [51]
Firm size (size)	Natural logarithm of total assets	Tran et al. (2017) [51]
C_1	The organizational learning capacity from the top firms	—
C_2	The learning capability from the previous best operational capacity vector	—
C_3	The inertia control ability of the current operational capacity vector	—

Note. ROA and ΔROA are dependent variables in the two studies, respectively; the other variables are treated as independent variables, in which one is used as a control variable, namely, firm size.

(H10) There is a positive correlation between inertia control ability and future performance improvement.

Regression methodology is deployed to capture the effects of strategic adjustment capacity on performance as measured by ΔROA. Corresponding to the previous hypotheses, the three different regression models are estimated:

$$\Delta\text{ROA} = \alpha_8 + \beta_8 C_1 + u_i \tag{11}$$

$$\Delta\text{ROA} = \alpha_9 + \beta_9 C_2 + \gamma_9 C_2^2 + u_i \tag{12}$$

$$\Delta\text{ROA} = \alpha_{10} + \beta_{10} C_3 + u_i, \tag{13}$$

where μ_i controlled the firm's individual effects.

3.3. Measurement of Variables. To remain consistent with previous studies of strategic management, measures pertaining to indices of operational capacity and strategic performance were the same as those in Deloof, Raheman and Nasr, and other similar studies [21, 24]. Table 1 summarizes the dependent, explanatory, and control variables.

To measure the strategic adjustment capacity (C_1, C_2, and C_3), we hypothesize that the strategic adjustment capacity of firms is consistent within a period of time and, thus, the equations can be constructed. Through updating, the strategic adjustment capacity of firms is calculated for each operational capacity vector within each period of time. Then, through mean value, the strategic adjustment capacity of firms is achieved for each operational capacity vector during the investigation. Thus, for any firm i ($i \in I$) and any index j ($j \in J$) in the operational capacity vector, the equations can be constructed as follows:

$$EC_{ij2} = \omega_{ij1} EC_{1jI_i\_\text{best}} + \omega_{ij2} EC_{ijT_1\_\text{best}} + \omega_{ij3} EC_{ij1} \tag{14}$$

$$EC_{ij3} = \omega_{ij1} EC_{2jI_i\_\text{best}} + \omega_{ij2} EC_{ijT_2\_\text{best}} + \omega_{ij3} EC_{ij2} \tag{15}$$

$$EC_{ij4} = \omega_{ij1} EC_{3jI_i\_\text{best}} + \omega_{ij2} EC_{ijT_3\_\text{best}} + \omega_{ij3} EC_{ij3} \tag{16}$$

$$\begin{aligned} EC_{ij5} &= \omega_{ij1} EC_{4jI_i\_\text{best}} + \omega_{ij2} EC_{ijT_4\_\text{best}} + \omega_{ij3} EC_{ij4} \\ &\vdots \end{aligned} \tag{17}$$

$$\begin{aligned} EC_{ijt+1} &= \omega_{ij1} EC_{tjI_i\_\text{best}} + \omega_{ij2} EC_{ijT_t\_\text{best}} + \omega_{ij3} EC_{ijt} \\ &\vdots \end{aligned} \tag{18}$$

$$\begin{aligned} EC_{ijT} &= \omega_{ij1} EC_{T-1jI_i\_\text{best}} + \omega_{ij2} EC_{ijT_{T-1}\_\text{best}} \\ &\quad + \omega_{ij3} EC_{ijT-1}. \end{aligned} \tag{19}$$

From (14)–(16), ω_{ij1}, ω_{ij2}, and ω_{ij3} can be achieved, marked by $\omega_{ij1t=2}$, $\omega_{ij2t=2}$, and $\omega_{ij3t=2}$, respectively. From (15)–(17), ω_{ij1}, ω_{ij2}, and ω_{ij3} can be achieved, marked by $\omega_{ij1t=3}$, $\omega_{ij2t=3}$, and $\omega_{ij3t=3}$, respectively. In turn, $\omega_{ij1t=T-1}$, $\omega_{ij2t=T-1}$, and $\omega_{ij3t=T-1}$ can be achieved. The size of these coefficients' absolute values represents the importance that firms attach to optimal operational capacity in the industry,

Table 2: Descriptive statistics for the sample.

Variable	Obs	Mean	Std. dev.	Min	Max.	25%	75%
ROA	28,993	0.000	0.984	−8.961	9.341	−0.499	0.411
NPM	28,993	0.000	0.984	−14.092	13.802	−0.265	0.295
OCR	28,993	0.000	0.984	−5.998	8.727	−0.570	0.663
SGFR	28,993	0.000	0.984	−2.357	14.762	−0.495	0.202
CHR	28,993	0.000	0.984	−2.766	12.416	−0.700	0.454
IT	28,993	0.000	0.984	−4.129	15.589	−0.518	0.160
LT	28,993	0.000	0.984	−2.734	11.155	−0.670	0.447
FT	28,993	0.000	0.984	−1.818	15.551	−0.477	0.089
Size	28,993	0.000	0.984	−3.900	3.828	−0.672	0.629

on record, and at present during the strategic adjustment. Therefore, the adjustment capacity shows the extent of the adjustment, and we define the adjustment capacity of each index in firm i as $\omega_{ij1} = |(1/(T-2)) \sum_{t=2}^{T-1} \omega_{ij1t}|$, $\omega_{ij2} = |(1/(T-2)) \sum_{t=2}^{T-1} \omega_{ij2t}|$, and $\omega_{ij3} = |(1/(T-2)) \sum_{t=2}^{T-1} \omega_{ij3t}|$. After calculating the adjustment capacity of each index, the matrix of the strategic adjustment capacity of firm i is achieved:

$$\boldsymbol{\omega}_{\mathbf{i}} = \begin{bmatrix} \omega_{i11} & \omega_{i12} & \omega_{i13} \\ \omega_{i21} & \omega_{i22} & \omega_{i23} \\ \omega_{i31} & \omega_{i32} & \omega_{i33} \\ \omega_{i41} & \omega_{i42} & \omega_{i43} \\ \omega_{i51} & \omega_{i52} & \omega_{i53} \\ \omega_{i61} & \omega_{i62} & \omega_{i63} \\ \omega_{i71} & \omega_{i72} & \omega_{i73} \end{bmatrix}. \tag{20}$$

There is a gap between the effects of different indices on performance, and, therefore, the impact of the strategic adjustment capacity of each index on performance improvement varies. Hence, we consider the effect of both the matrix of strategic adjustment capacity and each index on performance, and the initial value of the strategic adjustment capacity of firm i is achieved:

$$\left[C'_{i1}, C'_{i2}, C'_{i3}\right] = \left[|\alpha_1|, |\alpha_2|, |\alpha_3|, |\alpha_4|, |\alpha_5|, |\alpha_6|, |\alpha_7|\right] \times \boldsymbol{\omega}_{\mathbf{i}}. \tag{21}$$

To compare the strategic adjustment capacity among firms, the initial value is standardized, and the ultimate value of the strategic adjustment capacity is achieved.

$$C_{i1} = \frac{C'_{i1}}{C'_{i1} + C'_{i2} + C'_{i3}}$$
$$C_{i2} = \frac{C'_{i2}}{C'_{i1} + C'_{i2} + C'_{i3}} \tag{22}$$
$$C_{i3} = \frac{C'_{i3}}{C'_{i1} + C'_{i2} + C'_{i3}}.$$

4. Results

4.1. Data and Descriptive Statistics. This study includes Chinese listed firms in the manufacturing industry in the sample. These firms are assigned as manufacturing specialized equipment according to the Industry Classification Standard published by the China Securities Regulatory Commission. Our sample includes the A share-listed firms in the Shanghai and Shenzhen stock markets from 2002 to 2015. All of the data are drawn from the Tinysoft database (A financial database of Listed Companies in China created by Shenzhen Tianyi Science and Technology Development Co., Ltd.). The sample firms must satisfy the following criteria: (1) firms must participate in the manufacturing of specialized equipment, which includes manufacturing specialized equipment for petrochemicals, textiles, metallurgy, mining, electronics, agriculture, forestry, farming, fishing, and hydraulic industries, as defined by the China Security Regulatory Commission; (2) firms must be listed for more than three years; and (3) the number of firms in the industry for a given year must be greater or equal to three. We finally obtain 28,993 observations, and we standardize the data by industry as follows:

$$x'_{ijt} = \frac{x_{ijt} - \mu_{\text{ind}_i jt}}{\sigma_{\text{ind}_i jt}}, \tag{23}$$

where x_{ijt} represents the variable j of firm i in year t and $\mu_{\text{ind}_i jt}$ and $\sigma_{\text{ind}_i jt}$ represent the industry averages and standard deviations of variable j to which firm i belongs, respectively. Table 2 summarizes the statistics of the variables.

From Table 2, it is clear that there is a considerable gap between the firm performance in the selected samples and each index, which shows that the operational capacity and performance of sample firms differ significantly.

4.2. Results of the Effect of the Operational Capacity Vector on Performance. We used linear panel data regression models to estimate the causal relationships between the performance measured by ROA and the dependent variables chosen as the index of operational capacity and other control variables. As the regression model includes the lagged variables, the system GMM (generalized method of moments) is applied to estimate the dynamic panel data model. Table 3 shows the results of the dynamic panel data regression models (1)–(7).

Table 3: Results of the dynamic panel data regression.

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
NPM	0.556***						
	125.03						
OCR		−0.430***					
		−35.17					
SGFR			−0.315***		—		
			−33.42				
CHR				−0.053***			
				−6.62			
IT					0.148***		
					13.26		
LT						0.472***	
						40.05	
FT							0.257***
							21.95
Size	−0.267***	−0.188***	−0.270***	−0.243***	−0.215***	−0.051***	−0.202***
	−19.52	−10.03	−14.32	−12.18	−10.96	−2.67	−10.47
Lag ROA	0.241***	0.289***	0.299***	0.350***	0.339***	0.274***	0.309 ***
	43.33	36.69	37.84	42.89	41.74	35.61	38.01
Constant	−0.054***	−0.058***	−0.061***	−0.065***	−0.059***	−0.036***	−0.053***
	−17.64	−13.68	−14.33	−14.63	−13.36	−8.62	−12.2
Wald test	20352.60***	4450.81***	4293.790***	2959.05***	3124.92***	4778.61***	3543.21***
Sargan test	745.993***	807.533***	807.046***	866.568***	867.464***	809.926***	809.281***

Note. ∗ ∗ ∗ denotes 1% significance levels.

It is obvious from the Wald test values that all of the regression tests are significant at the 1% level, and Sargan test values also show that there is no overrecognition of the tool variables in the process of model estimation. The coefficients of the variables that we viewed as the firm's operational capacity vectors are all significant. The results show that NPM is positively related to ROA, which strongly supports our first hypothesis. The coefficients of OCR and SGFR are significantly negative; they provide strong evidence for Hypothesis 2. Models (4)–(7) demonstrate that the positive correlation between CHR, IT, LT, FT, and ROA is validated; the results support hypotheses (H4)–(H7). The control variables of firm size and lag ROA are also significant in each model.

The testing result of Hypothesis (H1) shows that, for an enterprise, the higher the net profit margin is, the more profits it can make after subtracting operational costs from business revenue. This may be attributed to the superiority of its products, the value of its brand, the customers' loyalty to it, and other relevant factors that enable it to sell products at a price higher than the market average; or to its cost control ability, so that it could sell products at market price at a lower cost. The verification of (H2) further suggests that an enterprise can take a cost leadership strategy to sharpen its competitive edge to gain more returns. As can be seen from the test of (H3), an enterprise can improve the return on assets (ROA) by optimizing its distribution channels and controlling its marketing expenses; reduce overheads, improve management efficiency, and increase ROA by establishing a modern business management system or adopting a flat organizational structure; finally, an enterprise with strong comprehensive strength has stronger bargaining power in financing and is able to increase ROA by controlling the financing scale and cost rationally. Every enterprise has been making equal efforts to maintain daily operations, seize investment opportunities, and chase returns on current investments, but it cannot hold much cash to wait for an investment opportunity. Holding excess cash in hand indicates that capital is not invested in high-return projects, and this may lower the total ROA. This is consistent with (H4). (H5)–(H7) are tenable, suggesting that an enterprise's capability for capital turnover has significant influence on ROA. To improve ROA, enterprises can increase the inventory turnover, liquid asset turnover, and fixed asset turnover. Overall, the results of hypothesis testing show that all the variables we used to construct the operational capacity vector have a significant correlation with ROA, so it is an important financial strategic factor to enterprises. In all, the strategic adjustment capacity of the operational capacity vectors may naturally affect changes in firm performance.

4.3. The Effect of Strategic Adjustment Capacity on Performance Improvement. As (14)–(19) show, the strategic adjustment capacity is calculated every three years. We use MATLAB 2015b (Explored by MathWorks, Natick, MA, UNITED STATES) to select the effective firms and years and calculate firms' strategic adjustment capacity and performance increases. Table 4 reports the descriptive statistics of the strategic adjustment capacity and performance improved.

Table 4: Descriptive statistics for strategic adjustment capacity.

Variable	Obs	Mean	Std. dev.	Min	Max.
ΔROA	2412	0.023	0.890	−8.056	10.435
C_1	2412	0.155	0.058	0.025	0.420
C_2	2412	0.489	0.084	0.211	0.826
C_3	2412	0.357	0.068	0.117	0.600

Table 5: Regression results of the effect of operational capacity on performance improvement.

	ΔROA		
	Model (11)	Model (12)	Model (13)
C_1	10.100**		
	13.95		
C_2		−78.837***	
		−19.87	
C_2^2		78.912***	
		19.77	
C_3			4.437
			0.68
Constant	−1.078***	19.091***	0.381
	−9.02	19.60	0.17
F-test	194.69***	197.43***	0.39

Note. ∗∗ and ∗ ∗ ∗ denote 5% and 1% significance levels, respectively.

Table 4 shows that the results of the performance improvement of the sample enterprises are both positive and negative during the tests, which suggests that the performance of some firms increases, while that of other firms decreases. From the maximum and minimum value of each aspect of the strategic adjustment capacity, there is a significant gap among firms in each dimension of the strategic adjustment capacity. The comparison of the average value of each dimension in strategic adjustment capacity shows that C_1 is minimal, while C_2 is maximal, which means that the firms have a stronger capacity to strategically adjust the optimal operating capacity with a lower learning capacity than the optimal operating capacity vector. This is associated with the fact that the adjustment of the optimal operating capacity vector of a firm is easier than the adjustment in the optimal operating capacity vector. Regression analysis shows the impact of the gap of strategic adjustment capacity among firms on performance. Table 5 shows the results of the impact of strategic capacity on the performance improvement capacity by OLS (ordinary least squares).

First, we focus on the effect of the strategic adjustment capacity on the performance improvement in the following year. In other words, the dependable variable is in our model. In Model (11), the F-test value is 194.69, which is significant at the 1% level, showing that a significant relationship is found between the capacity of learning in firms with optimal operation vector and ΔROA. The coefficient is 10.100, which implies a 1% increase in the capacity for learning from firms with an optimal operation vector, which is associated with an increase in ΔROA by 10.10%. This explains why firms observe the operation performance of the best firms in the industry in corporate competitions and explore how the successful firms determine the operation vector to increase performance. The results of the regression analyze Hypothesis 8 and show that there is a positive correlation between the capacity of the firms that learn from those with the optimal operational capacity and future performance increases. Figure 1 shows the regression of the Model (11).

Figure 1 depicts the relationship between enterprises' ability to learn from firms with the best operation vector in the same industry and performance improvement. The x-axis measures the enterprises' ability to learn from the firms with the best operation vector, and the higher C_1 indicates the higher weight of learning from the firms with the best operation vector in the same industry when they adjust the strategy. Through the distribution of sample points, most of the samples are below 40%; this may mean that these firms' willingness to learn from the best firm in the same industry is not so strong, or that the ability to learn is not very strong. A low C_1 indicates that C_2 or C_3 is very high, which means the enterprises tend to learn from their own optimal experience (C_2 is high) or excessive dependence on a configuration state (C_3 is high). The y-axis measures the change of ROA in the next year, and most of the sample is distributed between [−2, 2]. At the same time, it can be seen that with the increase in C_1, the number of samples of negative growth gradually reduces.

As shown in Figure 1, the slope of the regression line is positive, which indicates that enterprises that can learn from firms with the best operations are more likely to improve their performance, but some firms with average learning abilities are also likely to improve their performance. This might

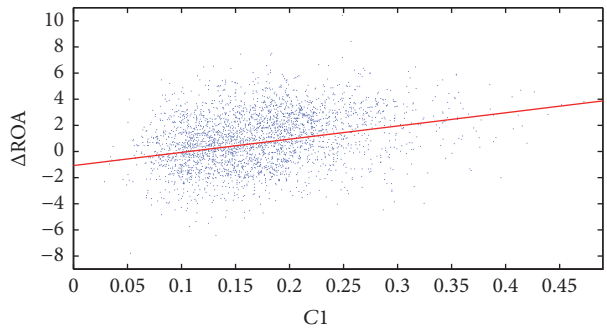

Figure 1: The relationship between the organizational learning capacity from the top firms (C_1) and performance improvement (ΔROA).

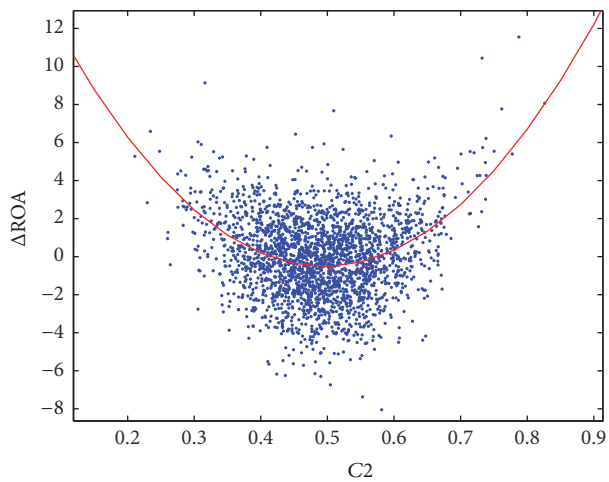

Figure 2: The relationship between the learning capability from the operational capacity vector of the previous best (C_2) and performance improvement (ΔROA).

be because these firms have good performance compared to other firms in the same industry whose corresponding operational capacity is already close to the maximum. Thus, they can achieve better performance by maintaining the best operational capacity vector in their records when making the strategic adjustment.

As (H8) is verified, we can consider that there is a similarity between an enterprise and a bird since the former aims to achieve higher performance in competition and the latter looks for food with the aim of finding some faster. For an enterprise, it will be able to increase ROA if it adjusts its financial strategies the way some industry peers with optimal performance deploy financial strategies. For investors, they may be able to obtain more returns on investment if they choose an enterprise that is more capable of learning how to deploy financial strategies from the most outstanding enterprise in the industry.

We argue that there is a process of changes of the effects of the extent to which firms rely on the optimal operational capacity vector for the performance. As a result, Model (12) is a nonlinear regression model. In this regression, a highly significant correlation is found between ΔROA and the extent to which firms rely on the optimal operational capacity vector. The monomial coefficient is −78.837, and the p value is 0.000, which implies that a 1% decrease in the extent to which firms rely on the optimal operational capacity vector is associated with an increase in ΔROA by 78.84%. This shows that firms are in a weaker position versus the competition and that by adjusting strategies, the operational capacity vector will not rely on the optimal level. Instead, the firms will adapt to the current environment and improve performance significantly. However, this does not mean that only this can improve performance effectively. The quadratic coefficient is 78.912 and the p value is 0.000, significant at the 1% level, which means that the firms have a competitive edge in the competition and are able to improve performance. During the strategic adjustment, the firms can maintain the operational capacity vector to achieve better performance and performance improvement. The results of the regression analyze Hypothesis 9; that is, there is a negative correlation between the extent to which firms rely on the optimal operational capacity vector and future performance improvement. However, when the dependence exceeds a certain level, its correlation with the future performance improvement is positive. Figure 2 shows the regression of Model (12).

Figure 2 describes the relationship between the enterprises' ability to learn from its own optimum vector and performance improvement. The x-axis measures the enterprises' ability to learn from its own optimum vector, the higher C_2,

and the higher weight of learning from its own optimum vector when adjusting the strategy. Through the distribution of sample points, most of the samples are distributed between 30% and 70%. This indicates that most enterprises emphasize their experience of operating successfully, and considering the status of the industry, they explore the core competitiveness of enterprises conducive to the accumulation of strategic adjustment when making the strategic adjustments decision. The y-axis still measures the change of ROA in the next year, and it can be seen that the sample distribution is more concentrated in the central region of C_2 and that the fluctuation of ΔROA is small. In the other region of C_2, the fluctuation and value of ΔROA are larger.

The relationship between the extents to which firms rely on the optimal operational capacity vector to record and improve performance to a U-shaped curve is shown in Figure 2. This suggests that to achieve performance improvement, in terms of the optimal operational capacity vector, the firms can maintain the advantage of the optimal operational capacity vector, develop their core competiveness, or rely less on the optimal operational capacity vector in a record to explore the operational capacity vector that fits their current circumstances and their own status.

(H9) is tenable, as we expected. Actually, if the overall direction is roughly consistent with food location for the birds that forage, the historical optimal location will have a reference value, and birds will be able to find the food faster by updating the historical optimal location constantly. However, if the location nearest to the food is also very far away from the food in the foraging process, this location will have no reference value compared with the location of the birds nearest to the food. Moreover, these birds nearest to the food will, however, be able to find the food faster if they do not refer much to their own historical location. Similarly, if an enterprise's historical optimal performance is very poor in the industry, its financial strategy deployment corresponding to its historical optimal performance will have no reference value. Thus, such enterprises are more likely to increase ROA if they give up their dependence on the historical optimal performance to break away from conventions. However, if an enterprise's historical optimal performance is better than the rest in the industry, its persistent reference to the financial strategy deployment corresponding to its historical optimal performance will help it sum up successful experience and accumulate core competitiveness to increase ROA.

The results from Model (13) show that there is no significant correlation between the inertia control ability of the current operational capacity vector of the firms and their performance improvement and, thus, Hypothesis 10 is not true. The possible reason why the inertia control ability has little effect on performance improvement is that the purpose of the inertia control ability is to examine the importance that the firms attach to the current operational capacity vector. However, performance corresponding to the current operational capacity vector may be very good. To achieve better performance, the firms must have better inertia control ability. That is, as the corresponding coefficient C_3 is bigger, the corresponding performance of the current operational capacity vector may be poor. To achieve better performance, the firms must avoid inertia, and the corresponding coefficient C_3 must be smaller. As a result, the effect of the inertia control ability on performance improvement cannot be considered in a simplistic manner. Instead, it is associated with the quality of the current operational capacity vector in each period.

In terms of the effect of the strategic adjustment capacity on performance improvement in the following year, namely, the dependent variable (ΔROA) in the model, Hypotheses 8 and 9 are tested. It is concluded that there is a positive correlation between the ability to learn from the firms with optimal operations and future performance improvement. We also see that there is a negative correlation between the extent to which firms rely on the best operational capacity vector and future performance improvement. As dependence exceeds a certain level, its correlation with future performance improvement is positive. In Hypothesis 10, the positive correlation between the inertia control ability and future performance improvement is not true.

In brief, the empirical analysis of the data from the manufacturing firms of specialized equipment shows that the bird flocking system is similar to the corporate competition system. The organizational learning capacity of the best firms and the capacity to maintain or depend on the best status have an effect on performance improvement. The interplay between the control ability of the current operation inertia capacity vector and performance improvement is not significant.

5. Managerial Implications

In the literature on industrial organizations, researchers combined theories in biology in a market competition framework to discuss pricing and profit problems and entry and exit timing from the perspective of game theory, including the Darwin phenomenon in industrial organization [53]. These studies are typically the research focus on how decisions are made. Our paper, which is different from these studies, focuses on sustainable competitive advantage from the perspective of corporate strategic adjustment. Following the bird flocking system, the situation in which an average firm learns from the top firms in an industry is similar to a bird flying toward the bird close to the food. Firms will achieve better performance if their learning capacities are strong. Instead of implementing a market strategy to achieve short-term performance, firms can create sustainable competitive advantage by improving strategic adjustment ability.

The empirical results show that the enterprise can obtain sustainable competitive advantage through the following steps: (1) create a vector using financial indicators, which have significant effects on performance; (2) follow the method mentioned above to measure enterprise strategic adjustment ability in three aspects; (3) set strategic goals and detailed implantation by analyzing the results in step (2) for competitiveness, resources, and environment.

In brief, the empirical analysis of the data from the manufacturing firms of specialized equipment shows that the bird flocking system is similar to the corporate competition system. The organizational learning capacity of the best

firms and the capacity to maintain or depend on the best status have an effect on performance improvement. The interplay between the control ability of the current operation inertia capacity vector and performance improvement is not significant.

6. Conclusions

Inspired by the bird flocking system, this paper investigates the effects of strategic adjustment in a corporate competitive system on its performance improvement. Moreover, each strategic adjustment is decomposed into three aspects: learning from the best firms, dependence or maintenance of advantage in their performance history, and inertial control of the current status. The samples are chosen from the firms manufacturing specialized equipment in China's machinery industry. The data suggest that there is a positive correlation between the capacity to learn from the best firms and the performance improvement. The relationship between the dependence or maintenance of a firm's advantages and performance improvement is observed to be a U-shaped curve, while no significant effect of inertial control on performance improvement is found.

Besides discovering an analogy between the better performance of firms and patterns of bird flocking, the operational capacity vector is also defined in this study. Empirically presenting the correlation between the operational capacity vector and the firm performance, the regression analysis is employed to show a firm's strategic adjustment, which is similar to the ways birds locate food and other birds in the bird flocking system. Therefore, the operational capacity vector of firms with optimal performance is analogous to the location of the bird closest to the food in bird flocking. Specifically, how the operational capacity vector corresponds to the optimal performance is analogous to the bird flocking system where the location of the bird is always closest to the most recently located food in the memory. The data have also shown that the corporate competition system is similar to the bird flocking system. First, similar to the ability to recognize and approach the location of the bird in the flock closest to the food for facilitate the searching bird to find food, firms with stronger abilities to learn from firms with better operational capacity are more likely to improve their performance. Secondly, if the location is closer to the memory in bird flocking, it will be closer to the location in memory. If the location is not closer to the memory at the moment, then it will search other directions. Similarly, the extent to which the firms rely on or maintain the operational capacity vector is determined by whether their corresponding performance is close to the optimal one. Finally, the inertia control ability of the bird regarding the current location in bird flocking depends on whether its location is close to the food. Likewise, the impact of inertia control on performance improvement is not significant; instead, it is associated with whether the current performance is close to the optimal one.

Finally, it is assumed that the operational capacity vector can fully represent the results of strategic adjustment. However, there are actually two problems. One point is that the operational capacity vector does not necessarily show the result of strategic adjustment. Considering the circumstances of other firms, some firms are able to take a number of strategic measures, such as reducing costs, focusing, diversifying, and horizontal and vertical integration, which are not always represented by the operational capacity vector. The other point is that the operational capacity vector varies during operation due to the overall environment changes in the industry, but firms do not change their strategies accordingly. As a result, the further research should focus on the selection and design of more scientific and comprehensive indices to depict the results of strategic adjustment. Furthermore, as each capacity in strategic adjustment is determined, equations are adopted in this study, but they do not occur in calculations or the actual operation of firms. Theoretically, innumerable solutions or no solutions might emerge. Thus, the method in this study may no longer be applicable. Hence, better solutions and methods for analyzing each capacity need further investigation.

This paper proposes a method to quantitatively measure the strategic adjustment capacity by referring to the bird flocking system. With this method, the relationship between firms' strategy adjustment capacity and performance can be obtained, which guides firms to improve their strategic adjustment capacity and maintain sustainable competitive advantages. The main contributions of this paper include the following aspects. (1) By interdisciplinary research, a new idea is put forward for studies on business competition and sustainable development. By virtue of the bird foraging system, a method is proposed for the optimization and adjustment of financial strategic resource allocation, suggesting that firms should learn from some industry counterparts with optimal performance and locate financial strategic resources according to their optimal performance in history. (2) Factors critical to corporate financial strategies are determined by empirical verification. The financial indicators cited in this study are key factors to corporate financial strategy, which have direct influence on ROA. Thus, enterprises should pay more attention to the optimal allocation of financial strategic resources. Unfortunately, this study only suggests that the enterprises that adjust their financial strategic resource allocation through highly referring to that of enterprises with optimal performance or adhere to their own unique financial strategic resource allocation in history can usually achieve higher performance. However, the study does not reveal which strategy will be more effective for what kind of industries or business entities in what kind of environments. Therefore, it is the further research direction to determine a more specific decision-making basis for enterprises by considering the industry factors, external environment and the corporate life cycle, and so on. (3) The method for evaluating the enterprise capability of financial strategy adjustment in this paper may inspire investors to make investments from a long-term and strategic perspective. Different from the conventional simple prediction made in accordance with financial statement data, the method proposed in this paper can be utilized to evaluate an enterprise's endogenous capacity for strategic adjustment of financial resource allocation. According to this method, the enterprises with strong strength are more likely to seize

every external opportunity and withstand all external risks to achieve relatively better performance even if some changes may occur in the external environment in the future.

Though the relationship between three aspects of strategic adjustment capacity and performance is discussed, these capacities may not measure strategic adjustment capacity sufficiently. As some connections between corporate competition and other theories in biology will make the research more comprehensive, this paper focuses on how to obtain sustainable competitive advantages by improving the strategic adjustment capacity. Another perspective is to discuss how these three aspects of strategic adjustment capacity affect the corporate performance. Additionally, firms with similar strategic adjustment capacity possibilities share similar features. Hence, it is interesting to analyze their performance and features through cluster and discriminant analyses for supporting the current theories or even putting forward new theories.

Conflicts of Interest

The authors declare no conflicts of interest.

Authors' Contributions

Shiyuan Wu developed the original idea and was responsible for data collection and processing. Shou Chen contributed to the research design and provided guidance. Chao Mao designed the algorithm and calculated the adjustment ability by MATLAB. Boya Li provided additional guidance and advice. All authors have read and approved the final manuscript.

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