

The influence of leadership style on organizational performance: an application of Meta-analysis

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ABSTRACT: *This paper mainly aims to understand the impact of the leadership pattern of the management of listed electronics companies in Taiwan on their organizational performance, and the collection of data is based on past studies by scholars at home and abroad, and the data collected will be analyzed by using Meta-analysis. The results show that the leadership style of the management of listed electronics companies in Taiwan does have a significant positive impact on organizational performance.*

KEYWORDS -*Leadership style, organizational performance, Meta-analysis*

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I. INTRODUCTION

Semiconductor industry for the national economic development of the key projects is a high capital and technology-intensive industry. In the global semiconductor major producers, Taiwan is the only country with a professional vertical division of labor system, under the active support of the policy to set up a science park, strengthen productivity, as the core to produce a huge clustering effect, has become a successful example of the development of the semiconductor industry in all countries of the world. Moreover, since the semiconductor industry is a high capital-intensive industry, in order to master the advantages in the rapidly changing era of knowledge economy, effective leaders are conducive to the operation of the organization, and one of the important trends in leadership research in recent years is the theory of transactional leadership and transformational leadership, trading leaders are mainly through the clarification of roles and the requirements of work, Guide or motivate followers. Transformational leaders, on the other hand, have their own charismatic qualities, will focus on individual care and intellectual inspiration to their subordinates, and also enhance their ability and sense of responsibility through higher levels of thinking or values, and encourage subordinates or members of the organization to put the interests of the organization first, stimulate the motivation of the subordinates to work hard and exceed the original intended objectives [1].

From the literature research at domestic and foreign countries in the past, it is pointed out that the leadership style of the supervisor has a positive and significant impact on the improvement of the organizational performance of the company, and can bring competitive advantage to the enterprise. Therefore, this study takes Meta-analysis as a research tool and understands the impact of the leadership style of the management of listed electronics companies in Taiwan on organizational performance. This is the main purpose of this study.

II. LITERATURE REVIEW

In order to understand the general situation of the relevant literature research with this topic, this paper hereby reviews the literature related to the subject of this study as follows:

2.1 Definition and pattern of leadership

In the past hundred years, the transformation and evolution of leadership patterns have found that leadership is flexible, and the leadership behavior is different with different situations.

However, whether a successful leader has a common experience, characteristics and leadership model is a topic that many scholars have been exploring for many years. In 1950, at Ohio State University in the United States, Hemphill and Coons two scholars began to develop the "Leader Behavior Description questionnaire, Ohio, LBDQ), their team analyzes the important elements of leadership through a questionnaire survey of workers in the military, manufacturing and education sectors, as well as student leaders, and finally puts forward "consideration" and " (initiating structure". Two major levels of leadership [2] [3] [4].

The so-called consideration is to the subordinate attitude, from the heart of the consideration of subordinates, respect for the feelings and well-being of subordinates, and advocacy is to complete the organizational goals, to assign and supervise subordinates to complete the work, in order to enhance productivity [5]. The University of Michigan study began almost at the same time as the Ohio State University study and the University of Michigan received two variables for leadership behavior, namely,

employee oriented and production oriented [6] . (1) Production oriented: This kind of leadership attaches importance to the achievement of work objectives, regards employees as a tool to achieve the goal, closely supervises employees, and emphasizes the exercise of legal position power and compulsion, and pays attention to the evaluation of progress and work performance, which is similar to the "advocacy" Structure of Ohio State University; (2) Employee Oriented: This kind of leadership attaches importance to interpersonal relationships, is very concerned about the welfare, needs, promotion and personal growth of employees, and gives subordinates full discretion, pay attention to communication within the unit, which is quite similar to the " consideration " Structure of Ohio State University. The University of Iowa Research explores three types of leadership, autocratic style, laissez Faire style and Democratic style [7] . (1) Autocratic style: Leaders often tend to centralize and imperative work practices, make their own decisions, and rarely consult with employees; (2) Laissez-faire style: Leaders often give the organization a full freedom to formulate policies that do not interfere with how employees are done; (3)

Democratic style: Leaders often tend to involve employees in policy formulation, delegation of authority, encouragement of employee participation in working methods and goals, and training of employees through feedback from employees. Dubrin [8] pointed out that leadership is the ability to motivate and give confidence to organizational members to achieve organizational goals.

In addition, Niu& Jiang [9] deemed that leadership behavior is a focus on leadership behavior (leadership, leadership style) that leads to the performance of a group or organization, in other words, the relationship between leadership behavior and leadership effectiveness. As for the leadership style, Cooper [10] pointed out that leadership is divided into two oriented: (1) Caring: Focus on departmental welfare, and establish good association and communication channels with subordinates; (2) controlling: Focus on organizational goals and performance. Divided from two to four categories: (1) High care and high control: Leaders in addition to pay attention to work progress, but also care about the organizational atmosphere and staff; (2) High care and low control: Leaders care for more employees than care about work progress; (3) Low care and high control: Leaders value work progress more than caring for employees; (4) Low care and low control: Leaders do not pay attention to the progress of work and employees. Li [11] divided the leadership type into (1) transactional leadership: To make the subordinates aware of their roles and to fulfill the tasks entrusted to them by the leaders; (2) Laissez-faire leadership: Refers to the responsibility of leaders to avoid leadership and decision-making, in which employees must complete their own work, and employees often have to seek the assistance of other colleagues, even outside the group, has achieved organizational goals; and (3) Transformational leadership: Leaders inspire a process in which subordinates pursue excellence and expand and enhance the needs and spiritual levels of their subordinates [12] .

Taken together, this study refers to the definition and type of operation of the leader is the classification of Dubrin [8] and Li [11] respectively.

2.2 Organizational Performance

Venkatram&Ramanujam [13] A complete organizational performance measurement construct is proposed, which is divided into: (1) Financial performance: refers to the basic guidelines for the use of traditional strategies, generally in the study of more commonly used indexes include interest rate, investment rate of return and sales growth rate etc. (2) Operational performance: In addition to the financial performance indicators, the way to measure operational performance can be divided into market share, new product introduction and product quality and other non-financial indicators;and (3) Operational effectiveness: In terms of operational effectiveness, refers to the non-financial guidelines and stakeholders related to the guidelines, for the relationship to achieve the goal of satisfaction.

Robbins [14] believed that performance is a measure of the achievement of organizational goals, that is, in assessing the Organization's effectiveness and efficiency in the use of the resources invested, and through the performance of good or bad, can be timely to correct the errors in the implementation of the strategy process. Borman&Motowidlo [15] considered that organizational performance refers to all activities that are closely related to the objectives of the enterprise, and that the extent to which these activities contribute to the objectives of the enterprise can be measured through quantitative pointers, with a view to judging the effectiveness of the activity and the rate of achievement of the objectives.

Kaplan & Norton [16] pointed out that external measurements emphasize "financial perspective" and "Customer perspective ", while internal measurement emphasizes the enterprise "internal process perspective " and "learning and growth perspective ". Ramaswamy, Kroeck&Renforth [17] believed that there are multiple criteria for the evaluation of financial pointers, which can be based on different subjects and ranges, such as: Asset rate on return (ROA), return rate on Sales (ROS), equity return rate (ROE), and Sales growth rate. Zheng, Wang & Zeng [18] pointed out that Performance, the original meaning refers to the degree of performance, which includes two levels of efficiency and effectiveness of the significance. Efficiency is measured by the ratio

of output to input, while Xie [19] pointed out that effectiveness refers to the achievement of organizational goals. As far as organizational management is concerned, what is pursued is the overall performance of both efficiency and effectiveness, and in the theory of incentive in management, it is interpreted as "the completion of a work by an employee" in organizational behavior, performance refers to "efficiency, effectiveness and Efficacy". The overall performance of the three constructs.

Lian [20] showed that performance refers to the extent to which an enterprise or organization achieves the specific objectives it has set, and the performance pointer is a variable that can be used to identify and prove whether the pre-planned goal effectiveness has a measure of achievement.

Schermerhorn, Hunt & Osborn [21] also pointed out that organizational performance is the result of the work of individuals or teams and even the enterprise as a whole, and can also be represented by the rate of achievement of corporate goals.

Ge [22] referred to the degree of output and input in the overall operation of the enterprise and the extent to which the objectives have been achieved, as well as the satisfaction achieved by the participants in the process of obtaining and utilizing the resources of the Organization and pursuing the achievements of the organizational goals in the course of the organization's operation. Huang [23] pointed out that in order to take into account the financial aspects of organizational performance; it is measured by the use of indicators of growth and profitability. For example, the company's earnings per share (EPS) is used as a measure of financial performance on top of the interbank average or with the company's shareholder return rate of equity (ROE) or return rate on asset (ROA) [24]. In retrospect, there are many studies on the structure of organizational performance measurement, because the final benefit will eventually give back to the financial construct, so most scholars will take financial performance as one of the measurement indexes.

In addition, Ling & Hong [24] also believed that organizational performance refers to the results achieved by the organization within the duration of the relevant undertakings and departments within its organization in order to achieve the goal of staging or wholeness. Liao [25] pointed out that the five characteristics of organizational performance are as follows: (1) Mutable: Different criteria at different stages of life; (2) Comprehensive: including different dimensions; and (3) Divergent: Different relationships with members of the Organization; (4) Transitive: The level of analysis does not have to change the relevant standards at the same time; and (5) Complex: The degree of dimension cannot be easily simplified or eliminated [26]. Taken together, the measurement of organizational performance in this study is based on the financial perspective of Huang [23] and Ling & Hong [24] To measure organizational performance, so "EPS" and "ROE" are used as indexes to measure organizational performance.

2.3 Relationship between leadership style and organizational performance and hypothesis inference

Kang [27] found that leadership patterns, organizational culture, job satisfaction and organizational learning all have a significant impact on organizational performance.

Shen [28] showed that leadership patterns have a significant positive effect on organizational performance.

Cheng [29] believed that both conversion leadership and transactional leadership have a positive impact on organizational performance.

Chen [30] pointed out that executive leadership style presents a positive and significant relationship to organizational performance.

Tsai [31] found that the leadership style of business owners has a causal relationship with organizational culture, and has a positive relationship to organizational performance.

From the above analysis, the object of discussion belongs to different industries or scale, but there are still similar views, so this study can still deduce the following hypotheses:

Hypothesis (H₁): The leadership style of the managers of listed IC design companies in Taiwan has a positive and significant impact on organizational performance.

III. RESEARCH METHOD

Based on the above research motivation, purposes and literature review, the research hypotheses are deduced, and the conceptual research framework of the following research models is established, as shown in Figure 3.1.

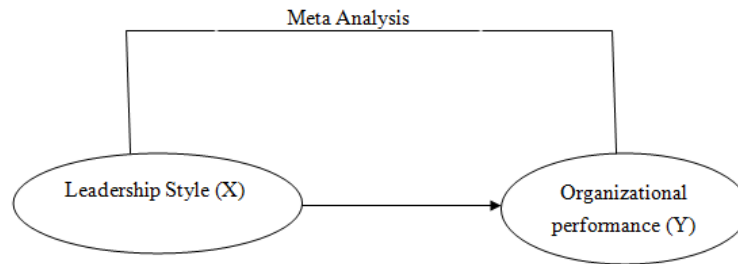


Figure 3.1 Research Framework

3.2 Data Collection and Research Method

The data collection in this study came from the Taiwan economic Journal, Taiwan database. This research model is for Meta-analysis and this study uses software for “Stata”. Moreover, this study assumes that the estimation parameters are consistent with the Normal Distribution, N.D., and when its standard error is large, the use of Random Effects is preferable to the Fixed Effects, so the Random Effects to compare multiple effects.

3.3 Theoretic Foundation for Meta-Analysis [32]

1. The Highlight of DerSimonian & Laird Method (Random effect method)

- (1) For binary or continuous outcomes
- (2) Effect size q_i for study i could be $\ln(OR), \ln(RR), RD$, difference in means or standardized mean difference.
- (3) Note that the effect sizes for OR and RR are logged.
- (4) Assumption that there is a single true answer that all studies are trying to estimate is relaxed.
- (5) Now assume that each study has a different true answer that they are trying to estimate.
- (6) Assume true effect sizes θ_i have normal distribution with mean θ and variance τ^2 .
- (7) τ^2 is the between-study variance.
- (8) Between study variance:

$$\tau^2 = \frac{Q - (k - 1)}{\sum_i w_i - \left[\frac{\sum_i w_i^2}{\sum_i w_i} \right]}$$

Where:

w_i are weights from the fixed effect inverse-variance method

Q is the heterogeneity test statistic form before (either form inverse-variance method or Mantel-Haenszel method)

K is the number of studies, and

τ^2 is set to zero if $Q < k - 1$

- (9) Random effect pooled estimate is weighted average:

$$\theta_{DL} = \frac{\sum_i w'_i \theta_i}{\sum_i w'_i}$$

- (10) Weights used for the pooled estimate are similar to the inverse-variance, but now incorporate a component for between-study variation:

$$w'_i = \frac{1}{SE(\theta_i)^2 + \tau^2}$$

- (11) When there is little heterogeneity, so Q is smaller than $k - 1$, $\tau^2 = 0$ and the weights are the same as the inverse-variance method.
- (12) When $\tau^2 > 0$ the weights are smaller and more similar to each other than in a fixed effect model.
- (13) Because the weights are smaller, the sum of weights will be smaller, and so the SE will be bigger, CIs wider, and p-values less significant.
- (14) Small studies will have relatively greater influence.
- (15) Advantages:
 - a. As widely applicable as the inverse-variance fixed effect model

- b. Incorporates heterogeneity into the model
- 2. Confidence interval for pooled estimate

A 95% CI for the pooled estimate θ is:

$$\theta - (1.96 * SE(\theta)) \text{ to } \theta + (1.96 * SE(\theta))$$

For ratios, θ is the log-transformed estimate.

- 3. Test for overall effect

Overall significance test for whether the pooled estimate is significantly different from zero (no effect):

$$z = \frac{\theta}{SE(\theta)}$$

Look up z in tables of the normal distribution to get the p-value.

For ratios, θ is the log-transformed estimate.

- 4. Test for heterogeneity

- (1) Look up Q in tables of the chi-squared distribution on k-1 degrees of freedom. The null hypothesis is that the true effect size is the same for all studies.
- (2) A statistically significant result means that there is strong evidence against there being one common effect size, so we take it that there is heterogeneity.

- 5. Getting Data into Stata

- (1) Easier to enter into Excel then cut & paste into Stata's data editor
- (2) Ensure each numeric column contains only numbers
- (3) Leave cells empty if data missing
- (4) One row per study

IV. RESULTS AND ANALYSIS

The results of the meta-analysis on random effects are summarized in Table 1.

Table 1: Random Effects

Study		WMD (95% CI)	%
Kang [27]		6.23 (6.01, 6.36)	19.14
Shen [28]		6.17 (5.92, 6.30)	19.16
Cheng [29]		6.42 (6.10, 6.53)	20.39
Chen [30]		6.31 (6.00, 6.44)	20.43
Tsai [31]		6.43 (6.11, 6.54)	20.68
Overall (I-squared=63.1%, p=0.00)		6.31 (6.03, 6.43)	100.00
NOTE: Weights are from random effects analysis			
Scale Range			3 4 5 6 7 8

The above results show an overall I-squared=63.1% and p-value=0.00, so we are able to realize that the independent variables of this study's model have a positive and significant effect on the dependent variables.

V. CONCLUSION AND SUGGESTION

5.1 Conclusion

From the above, the leadership style of the management of listed electronics companies in Taiwan has a significant positive impact on their organizational performance.

And this study found with Kang [27] , Shen [28] , Cheng [29] , Chen [30] , Tsai [31] of the results are consistent.

5.2 Research contribution

The results of this study can also be provided as a reference for the sustainable development of listed semiconductor companies in Taiwan, so the results are of great practical reference value. In addition, looking back at the relevant literature in the past, most of the use of regression analysis to do exploratory research, rarely using Meta-analysis as a research method. So this study is more innovative.

5.3 Future research directions

As mentioned earlier, this study is aimed at the management of Taiwan listed electronics companies as the main research objectives, and the past domestic and foreign literature, the use of Meta-analysis to understand the impact of their leadership style on the organization's organizational performance, it is suggested that follow-up researchers may consider attempting to study other industries, or other research methods.

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