

VERIFYING THE EFFECTS OF LEADERSHIP STYLES UPON ORGANIZATIONAL PERFORMANCE: USING ORGANIZATIONAL CULTURE AND ORGANIZATIONAL CHANGE AS DUAL-FACTOR DISTAL MEDIATORS

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ABSTRACT

The purpose of this study is to verify the effects of leadership style in listed IC design companies in Taiwan on organizational performances, with organizational culture and organizational change as the mediators. A questionnaire-based survey was conducted on directors and the above levels of supervisors in these companies with simple random sampling. The overall model's goodness-of-fit effect concerning the overall model and the structural model were verified using linear Structural Equation Modeling (SEM). Regarding the path coefficients for implicit/unobservable variables in the structural model, the MacKinnon PRODCLIN 2 program was employed to test how significant the model's total effect, specific mediating effects and direct effects are. Research results showed that: (1) the overall model has a statistically significant total effect, which suggests a distal mediating effect in the model constructed by the author; (2) leadership style exerts a significantly direct effect on organizational performances; (3) both organizational culture and organizational change exert significant and similar levels of specific mediating effects.

Keywords: Leadership style, Organizational culture and performance, Organizational change

INTRODUCTION

Semiconductor is a focus area for economic developments of a country. It is a highly capital-intensive and technology-intensive industry. Among the key producers in the global semiconductor industry, Taiwan is the only country with a vertically integrated system. Science parks were established under the policy support. A massive and productive cluster of semiconductor companies were formed as a result. In fact, Taiwan has become a success story in the development

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of the semiconductor industry in the world. The complete supply chain of the Taiwanese semiconductor industry creates unparalleled competitiveness in terms of efficiency and cost structure. It is also an excellent environment for the booming development of IC design houses (Peng, 2009). The IC design sector has experienced rapid growth, leveraging the existing niche in manufacturing and policy support in Taiwan. Taiwanese IC design houses account for 22.1% of the global share, the second highest in the world. Meanwhile, IC design is at the forefront of the semiconductor supply chain (ranging from design, manufacturing, testing, packaging and support). The technological competences and capacity of IC design houses are critical to the development of the Taiwanese semiconductor industry (Chen and Lee, 2012). Meanwhile, how leadership styles, organizational culture and organizational change relate to organizational performances is an important issue. A collaborative and innovative culture in an organization, the appropriate dealing of the resistance against organizational change and optimal leadership styles should be able to create strong performance for the organization. In other words, leaders should adopt the suitable leadership styles in the face of employees of varying characteristics and according to the organizational culture. The application of the optimal leadership styles can reduce the resistance against organizational changes, strengthen the solidarity of employees and enhance organizational performances. Many studies also suggest that leadership styles are the biggest environmental factor that influences organizational performances, morale and satisfaction (Huang, 2007).

Consequently, this author conducted a case study of the listed IC design houses in Taiwan and built a research model for analyses/verification in an attempt to understand the model's goodness-of-fit. The specific purposes of this study are:

1. To verify and understand whether leadership styles have a distal mediating effect on organizational performances in listed IC design houses in Taiwan
2. To verify and understand whether leadership styles exert a significant, positive and direct effect on organizational culture in listed IC design houses in Taiwan
3. To verify and understand whether leadership styles, mediated by organizational culture, exert a significant, specific and indirect mediating effect on organizational performances in the listed IC design houses in Taiwan
4. To verify and understand whether leadership styles, mediated by organizational change, exert a significant, specific and indirect mediating effect on organizational performances in the listed IC design houses in Taiwan
5. To determine which of the three mediating paths (i.e. via organizational culture, via organizational change and via both) has the largest specific indirect effect.

LITERATURE REVIEW

The purpose of this study is to verify the effects of leadership styles on organizational performances in listed IC design houses in Taiwan, with organizational culture and organizational change as the mediators. The relevant theories and studies are stated as follows:

Definitions of leadership and different leadership styles

Leadership styles have evolved and changed over the past century. In fact, leadership should be flexible and manifested with varying leadership behaviors in different scenarios. Whether successful leaders share similar experiences, attributes and leadership patterns has been a major academic issue. Robbins (2001) believes that leadership is the ability to influence an organization or a group to achieve a common goal. Dubrin (2001) indicates that leadership is the ability to inspire members in an organization and give them confidence to achieve organizational goals. Fry (2003) suggests that leadership is the methods and strategies to inspire members in an organization so that they can realize their potential and pursuit growth. Bruce and Kathleen (2005) argue that leaders recognize the diversity of members in an organization. Leaders seek to achieve shared goals and values of the organization through innovations and non-destructive methods. Training and education, as well as necessary internal resources and support are provided to encourage the growth of all the members and achieve the goals of the organization.

Kuo-Liang Cheng (2011) divides leadership styles into (1) transactional leadership; (2) faire leadership; (3) authority leadership; (4) transformational leadership and (5) situational leadership. Lee (2002) divides leadership styles into (1) transactional leadership: enabling subordinates to understand their roles so that they can accomplish the tasks assigned by leaders; (2) faire leadership: the avoidance of involvement from leaders in the decision making process of subordinates so that employees have to accomplish tasks independently or by seeking the assistance of colleagues or other teams to achieve organizational goals; (3) transformational leadership: inspiring subordinates to achieve excellence, expand their minds and enhance their psychological needs (Bass, 1985). In sum, this study refers to the definitions by Dubrin (2001) and the classifications by Lee (2002) regarding the operational definitions and classifications of leadership.

Organizational culture

Modern society is known for its diversity. As a result, any given organization contains different natures of cultures. It is a challenge to the leaders who need to use their wisdom in order to integrate diversified cultures into a growth momentum for the organization. Liao *et al.* (2009) highlight the importance of the organizational culture to company development because it is the soul of a corporate life. Yu (2003) suggests that organizational cultures are shared and taken for granted by organizational members. They determine how organizational members perceive, think

and response in specific environments. Robbins (2005) argues that organizational cultures are shared by all members so that they have a distinctively different value system. A detailed review finds that this common value system is the manifestation of the emphasized characteristics within an organization. Zheng (2011) categorizes organizational cultures into four levels, i.e. rational, innovative, clan and hierarchical. In sum, this study refers to the definitions by Yu (2003) and the categorization by Zheng (2011) regarding the operational definitions and classifications of organizational cultures.

Organizational change

Wu (1986) believes that organizational changes are the adjustment process to enhance organizational cultures and members' capabilities in response to environmental changes and in the pursuit of equilibrium, so as to achieve survival and development. Du (2001) indicates that to survive and thrive, organizations have to constantly adjust themselves in response to the challenges and tests in the internal and external environments. This adjustment is a change. Lee (2005) holds that to respond to the impact from the external environment and the needs arising from internal environment, organizations initiate changes on the individual level or the organization level in order. Organizational changes are an adjustment process to effectively cope with growing competition and to improve services. The ultimate goal of this process is to ensure the survival and development of an organization. As far as the patterns of organizational changes, Lewin (1951) suggests three steps: unfreezing, moving and refreezing. According to Lewin, changes come in specific stages. When organizational members are aware of the pressures to change as a result of changes in internal/external environments, they initiate changes on the organizational, technical and personnel level to achieve the intended goal. When the goal has been reached, the transformation results are frozen to ensure the achievement of the intended outcome. In sum, this study refers to the definitions by Wu (1986) and the categorization by Lewin (1951) regarding the operational definitions and classifications of organizational changes.

Organizational performances

Szilagyi and Wallar (1980) mentioned that performances are the tool to evaluate the efficiency or effectiveness of resources utilization within an organization. They reflect the actions the individuals take to achieve organizational goals and direct the future distribution of organizational resources. Venkatraman and Ramamujam (1986) believe that the assessment of organizational performances can be divided into financial, operational and organizational effectiveness. According to Ramaswamy *et al.* (1996), there are multiple standards for performance evaluations enabled by financial metrics. That is, single constructs such as Return on Assets (ROA), Return on Sales (ROS), ROE and sales growth could be adopted as performance measures, depending on the target and scope of research. According to Zheng *et al.* (1997), initially referring to how much the results of an endeavor are shown, performance is a concept significant in the two different layers of efficiency and effectiveness. While efficiency is the output-to-input ratio, effectiveness is the

degree of goal achievement for an organization (Hsu-chung Hsieh, 2006). Organizational operations are pursuits of results that are both efficient and effective. According to the motivation theory of management sciences, performance is interpreted as “a piece of work completed by an employee”. The science of organizational behavior, nevertheless, refers to performance as “an integrated success consisting of efficiency, effectiveness and efficacy”.

There are a massive number of studies on the measurement dimensions of organizational performance. Since the benefits of organizational performance will eventually be fed back to the financial dimension, most scholars adopt financial performance as one of the measures. Ling and Hong (2010) argued that organizational performances are the achievement of stage-based or overall goals of an organization and the results from relevant divisions and departments before specified deadlines. Huang (2008) used growth and profitability to measure the financial results of organizational performances. For example, EPS (earnings per share) should be above the industry average. ROE (return on equity) or ROA (return on assets) can serve as financial performance measures (Ling and Hong, 2010; Chang and Lee, 2012). In sum, this study refers to Huang (2008) and Ling and Hong (2010) to measure organizational performances with financial metrics, i.e. EPS and ROE.

The relationship between leadership styles and organizational performances

Many studies show that leadership styles are the biggest environmental factor that influences organizational performances, morale and satisfaction (Huang, 2007). To a certain extent, the studies mentioned above displayed similar viewpoints even if they do not discuss companies from the same industry or of the same size. Therefore, this study's author boldly proposes the following hypothesis:

H1: Leadership styles in the listed IC design houses in Taiwan affect their organizational performance in a significantly positive way.

The relationship between leadership style and organizational culture

Yeh (1999) believes that organizational cultures are created via the strong responses from subordinates to the behavior and actions of leaders. For example, if subordinates notice that leaders are focused on control, they will gradually come to understand the convictions and values of leaders. Meanwhile, leaders will align themselves with the values they seek to elaborate in order to strengthen organizational cultures. Hong (2002) suggests that among the variables that influence organizational cultures, leadership styles are the most critical one. Chen (2003) argues that leadership styles have a certain influence over organizational cultures. Tang (2010) contends that leadership styles and organizational cultures are significantly and positively correlated. Hence, this study purports the following hypothesis:

H2: Leadership styles in the listed IC design houses in Taiwan significantly, positively and directly affect organizational cultures.

The relationship between organizational cultures and organizational performances

Chiu (2007) proves that organizational cultures have influence over organizational performances via the mediating effects of organizational learning. Chiu (2007) believes that organizational cultures have positive and significant influence on organizational performances. Chung (2007) indicates that organizational cultures exhibit significantly positive effects on organizational performances. To sum up, this study's author proposes the following hypothesis:

H3: The organizational cultures among managers in the listed IC design houses in Taiwan significantly, positively and directly affect organizational performances.

The relationship between leadership styles and organizational change

Hsu (2007) contends that leadership styles have significant influence over organizational changes. Li (2008) believes that the transformational leadership and transaction leadership from school masters have influence on schools. Huang (2009) indicates that leadership styles and organizational changes are partially related. Although the above literature does not cover the IC design industry, this study is still able to purport the following hypothesis:

H4: Leadership styles in the listed IC design houses in Taiwan significantly, positively and directly affect their organizational changes.

The relationship between organizational changes and organizational performances

Hsueh (2003) contends that organizational changes and organizational performances are positively correlated. Tseng (2005) suggests that organizational changes have significantly positive effects on organizational performances. Hsiao and Chen (2008) indicate that both organizational changes and IT investments are positively correlated with organizational performances. Although the above literature does not cover the IC design industry, this study is still able to purport the following hypothesis:

H5: Organizational changes in the listed IC design houses in Taiwan significantly, positively and directly affect their organizational performances.

The relationship between organizational cultures and organizational changes

Hu (1998) pointed out the positive correlation between organizational cultures and the level of support for organizational changes. Tsai (2002) argues that the organizational cultures in junior high schools have significantly positive influence on the level of support for organizational changes. Lai (2005) contends that the organizational cultures in schools are positively correlated

with their attitude towards organizational changes. Li (2010) believes that organizational cultures have significantly positive influence on organizational changes. Although the above literature does not cover the IC design industry, this study is still able to purport the following hypothesis:

H6: The organizational cultures in listed IC design houses in Taiwan exert a significant, positive and direct effect on their organizational changes.

RESEARCH METHOD

Figure 1 illustrates how motivations, research objectives and literature review cited in the previous passages leads to this study's hypotheses and conceptual research framework:

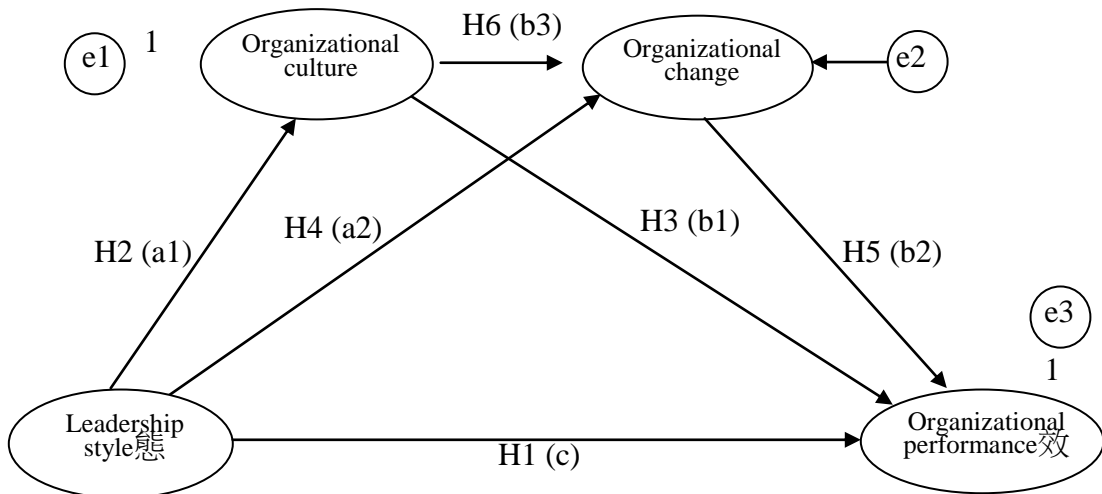


Figure 1: Conceptual research framework

The design of questionnaire and CMV test

DESIGNING THE QUESTIONNAIRE

The questionnaire in this study was compiled on the basis of multi-dimensional measurement, combined with the afore-mentioned observable perspectives. On a 7-point Likert Scale, the answers were measured with 7 denoting Strongly Agree and 1 denoting Strongly Disagree: the score grows in proportion to the degree of agreement. This study refers to the questionnaire designed by Lee (2002) concerning the dimension of leadership styles, which are further divided into three sub-dimensions, i.e. transactional leadership, faire leadership and transformational leadership. There are three questions covering each sub-dimension and there are a total of nine questions. This study refers to the questionnaire designed by Zhen (2011) concerning the dimension of organizational cultures, which are further divided into four sub-dimensions, i.e. rational culture, innovative culture, clan culture and hierarchical cultures. There are three questions covering each sub-

dimension and there are a total of twelve questions. This study refers to the three steps developed by Lewin (1951) for transformation process and these three steps, unfreezing, moving and refreezing, are defined as variables. The item set for this dimension contains a total of six questions, with two covering each variable. Finally, this study refers to Huang (2008) and Ling & Hong (2010) for the item set concerning the financial metrics as the measurement for organizational performances. There are a total of six questions on EPS and ROE as the indicators to organizational performances.

CMV test

This study's author had been considering ways to lower the CMV ever since the questionnaire copies were given out for a survey. After the completion of CFA, a Haman's single-factor test and a single-factor CFA (i.e. single-factor CMV test) were conducted to examine whether or not there is CMV regarding the perspectives. In other words, the chi-square difference testing allowed this study's author to at least declare an insignificant CMV in case of a statistically significant difference (Chang, 2011).

Sampling method

This study conducted a questionnaire-based survey on directors and above levels of supervisors in the listed IC design houses in Taiwan. Simple random sampling was used to yield information from the population and copies of questionnaire sent out via mail, followed by convenience sampling to avoid excessively low response rates. 30 copies of questionnaire were given out to experts in a pilot-test. A post-test was conducted after modifying the questionnaire in accordance with the experts' suggestions. 650 copies of the official questionnaire were given out, with 197 valid copies returned at a 30.31% response rate (Fritz and Mackinnon, 2007).

The data obtained from questionnaire and measurement model

This study's author adopted Linear SEM in a Confirmatory Factor Analysis (CFA) of the research framework and based the questionnaire design on four latent variables (i.e. leadership styles, organizational cultures, organizational changes and organizational performances), each of which was divided into observable/explicit sub-variables that contain several questions, as shown in the table below. After processing the collected data, the author created a primary file that preceded the design of questionnaire, using multi-dimensional measurement for construction of this study's measurement model. However, the data was measured by dual parcels (i.e. dual parcel measurements) to ensure the computer software efficiently handled and/or measured all data (Chen, 2010). Table 1 shows the number of questions under each implicit or explicit variable, as well as the referential sources (Chang and Lee, 2012).

Table 1: Number of questionnaire items under each ‘implicit variable’ and ‘observable variable

Implicit Variables	Explicit Variables	Total Number of Questionnaire Items	Referential Sources
Leadership styles (X)	(1) Transactional leadership	3	Lee (2002)
	(2) Faire leadership	3	
	(3) Transformational leadership	3	
Organizational cultures(ME1)	(1) Rational culture	3	Zhen (2011)
	(2) Innovation culture	3	
	(3) Clan culture	3	
	(4) Hierarchical culture	3	
Organizational changes (ME2)	(1) Unfreezing	3	Lewin (1951)
	(2) Moving	3	
	(3) Refreezing	3	
Organizational performances(Y)	“EPS”	3	Huang (2008) and Ling & Hong (2010)
	“ROE”	3	

RESULTS AND ANALYSIS

Linear structural model analysis

This study includes a CFA, an analytical method contrary to the Exploratory Factor Analysis (EFA), on the four implicit/latent variables of leadership style, organizational culture, organizational change and organizational performance. SEM is made up of structural and measurement models to efficiently tackle the causal relationships among implicit/latent variables. The three parts of model-testing in this study are: (1) goodness-of-fit of the measurement model; (2) goodness-of-fit of the structural model; (3) the overall model’s conformity with goodness-of-fit indices. In other words, goodness-of-fit indices were applied to a test of the overall goodness-of-fit effect of SEM (Diamantopoulos and Siguaw, 2000; Lee, 2011).

CMV Test

This study performs a CFA test and finds no common-method-variance problems, as Table 2 shows.

Table 2: The results of CMV test

Model	χ^2	DF	$\Delta\chi^2$	ΔDF	P
Single Factor	1327.6	97	895.2	99	0.002
Multi-Factors	432.4	196			

Analyzing fit of the measurement model

To a large extent, factor loading is intended to measure the intensity of linear correlation between each latent/implicit variable and a manifest/explicit one. The closer the factor loading is to 1, the better an observable variable is in measuring latent variables. Since this study’s reliability is supported by the fact that factor loadings for all observable variables range between 0.7 and 0.9, all observable/explicit variables in the measurement model appropriately gauged the latent/implicit ones. The Average Variance Extracted (AVE), on the other hand, gauges an implicit/implicit variable’s explanatory power of variance with regard to an observable one, with the AVE value growing in proportion to the reliability and convergent validity of that particular implicit/latent variable. As a rule, AVE must be larger than 0.5 for an observable variable’s explainable variance to exceed the measurement error (Fornell and Larcker, 1981). Since the values of factor loadings, Composite Reliability (C.R.) and Cronbach’s α in this study all exceed 0.7, with AVE values invariably larger than 0.5, the latent/implicit variables have excellent reliability and convergent validity (see Table 3, Table 4 and Figure 2).

Table 3: Judgment Indicators for the Measurement Model

Implicit/latent variables	Observable/explicit variables	Factor Loading	Composite Reliability, R.	C. Cronbach’s α	Average Variance Extracted, AVE
Leadership style	x1	.813	.814	.803	.604
	x2	.824			
Organizational culture	ϵ 1	.823	.821	.813	.614
	ϵ 2	.814			
Organizational change	ϵ 3	.813	.811	.803	.611
	ϵ 4	.821			
Organizational performance	y1	.813	.812	.803	.661
	y2	.813			

Table 4: Estimated values for discriminant validity within the confidence interval

Parameter	Estimate	$\Psi \pm 2\sigma$		Bias-corrected		Percentile method	
		Lower	Upper	Lower	Upper	Lower	Upper
		X \leftrightarrow ME1 \leftrightarrow	.481	.304	.622	.301	.610
ME1 \leftrightarrow ME2 \leftrightarrow	.522	.421	.624	.410	.613	.413	.624
ME2 \leftrightarrow Y \leftrightarrow	.481	.382	.584	.382	.572	.384	.591
ME1 \leftrightarrow Y \leftrightarrow	.473	.381	.564	.371	.554	.381	.564
X \leftrightarrow ME2 \leftrightarrow	.471	.401	.544	.391	.524	.401	.543
X \leftrightarrow Y \leftrightarrow	.491	.391	.582	.381	.563	.391	.563

ANALYZING FIT OF STRUCTURAL MODEL

Path analysis results of structural model

This study's author made sure that the model passed the goodness-of-fit test before calculating the parameter estimates, Standard Errors (S.E.) and Critical Ratio (C.R.) among latent variables, as shown in Table 5 and Table 6 (Leeb, 2008).

Table 5: Path analysis results of the structural model (Un-standardized)

Path coefficients for each pair of latent variables	Estimate	S.E.	C.R.	P	Label
Leadership style (X) → Organizational culture (ME1)	0.993	0.123	8.073	***	c
Organizational culture (ME1) → Organizational change (ME2)	1.104	0.131	8.427	***	b3
Organizational change (ME2) → Organizational performance(Y)	1.002	0.133	7.534	***	b2
Organizational culture (ME1) → Organizational performance (Y)	1.003	0.171	5.865	***	a1
Leadership style (X) → Organizational change (ME2)	0.972	0.151	6.437	***	a2
Leadership style (X) → Organizational performance (Y)	0.951	0.152	6.257	***	b1

Note: * indicates $P < 0.05$; ** indicates $P < 0.01$; *** indicates $P < 0.001$

Coefficient of determination

The R² value (Squared Multiple Correlation, or SMC) indicates how well an implicit independent variable explains an implicit dependent one. Therefore, the R² values shown in Table 7 indicate that the implicit independent variables have adequate explanatory power on the implicit dependent variables, respectively. In Table 7, the coefficients of determination in path analysis, small as they may be, suggest that the implicit independent variables have a certain level of explanatory power (albeit slightly low) regarding the implicit dependent ones, respectively.

Indices of fit of the overall model

This study's author adopted SEM for modeling in order to explore how implicit variables connect to one another in the Structural Model, whether the measurement model has measurement reliability, and how the overall model's goodness-of-fit effect is. While χ^2 , d.f., GFI, AGFI, NFI, CFI, RMR and RMSEA are the goodness-of-fit indicators for the overall model, it is preferable that $\chi^2/d.f. < 5$, $1 > GFI > 0.9$, $1 > NFI > 0.9$, $1 > CFI > 0.9$, $RMR < 0.05$ and $RMSEA < 0.05$ (Bagozzi & Yi, 1988). In this study, the overall model has a satisfactory goodness-of-fit effect because $\chi^2/d.f. < 5$ and the values of GFI, AGFI and NFI all exceed 0.90, with a below-0.05 RMR, as shown as in Table 8 (Leea, 2011).

Table 6: Standardized regression weights: (Group number 1–Default model)

Path coefficients for each pair of latent variables	Estimate
Leadership style (X) → Organizational culture (ME1)	.641
Organizational culture (ME1) → Organizational change (ME2)	.822
Organizational change (ME2) → Organizational performance (Y)	.661
Organizational culture (ME1) → Organizational performance (Y)	.642
Leadership style (X) → Organizational change (ME2)	.683
Leadership style (X) → Organizational performance (Y)	.672

Note: * indicates P<0.05; ** indicates P<0.01; *** indicates P<0.001

STANDARDIZED RESULTS OF SEM ANALYSIS

The model’s overall framework was resulted from computer-aided standardization, as shown in Fig 2.

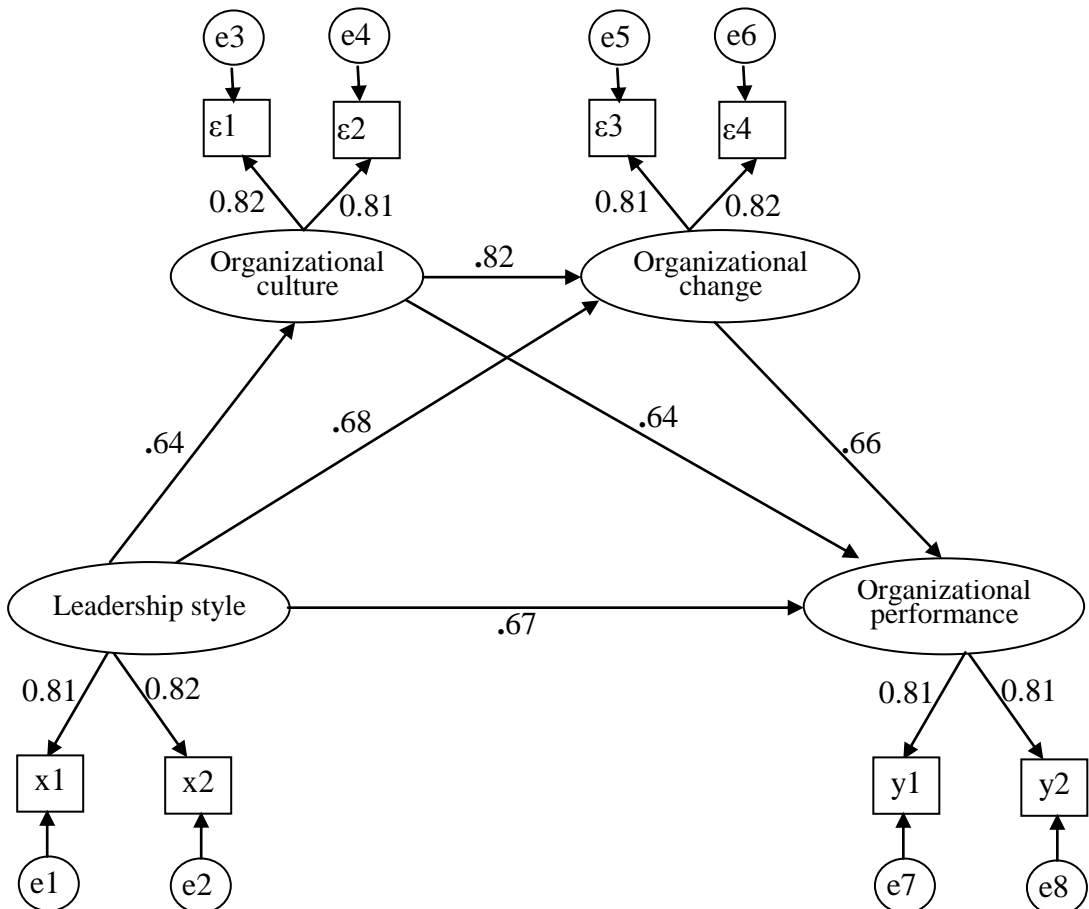


Figure 2: Standardized results of SEM analysis

Table 7: Path coefficient of determination

Coefficients of Determination	R ²
Leadership style (X) →Organizational culture (ME1)	.231
Organizational culture(ME1) →Organizational change (ME2)	.272
Organizational change (ME2) →Organizational performance (Y)	.231
Organizational culture(ME1) →Organizational performance (Y)	.224
Leadership style (X) →Organizational change(ME2)	.222
Leadership style (X) →Organizational performance (Y)	.241

Table 8: Assessment of fit of the overall model

Determination Index	χ^2	DF	GFI	AGFI	NFI	CFI	RMR	RMSEA
Fit value	882.66	453	0.914	0.901	0.802	0.721	0.041	0.032

Analytical testing of path effects for the structural model

Focused on the path coefficients between implicit/unobservable variables in the structural model, this study's author adopted Mackinnon PRODCLIN 2 in an analytical test (MacKinnon, Fritz, Williams and Lockwood, 2007) to determine the statistical significance of that model's path effects, distal mediation effect, specific mediation effect, direct effect and total effect (see Table 9). According to Table 4.8, the distal mediation effects, specific indirect mediation effects, direct effects and total effect are all significantly positive in this study's structural model. The structural model in Figure 2 contains path coefficients that suggests: (1) the distal mediation effect in the structural model is denoted by $a_1*b_3*b_2$; (2) the specific indirect effect of organizational culture is denoted by $(a_1*b_1) / (c+a_1*b_1)$; (3) the specific indirect effect of organizational change is denoted by $(a_2*b_2) / (c+a_2*b_2)$; (4) the direct effect is denoted by (c); (5) the total effect is the sum of indirect and direct effects. Values of the five effects were calculated as follows:

- (1) The distal mediation effect regarding path coefficients in the structural model = $(a_1*b_3*b_2) = 0.641*0.822*0.661 = 0.348$.
- (2) The direct effect = (c) = 0.641
- (3) (I) The total effect concerning the leadership style variable = indirect effect+ direct effect = $0.642*0.672+0.641 = 0.431+0.641 = 1.072$
- (4) The total effect concerning the organizational performance variable = indirect effect+ direct effect = $0.683*0.661+0.641 = 1.092$
- (5) The specific indirect effect of organizational culture = $(a_1*b_1) / (c+a_1*b_1) = (0.642*0.672) / (0.641+0.683*0.661) = 0.402$
- (6) The specific indirect effect of organizational change = $(a_2*b_2) / (c+a_2*b_2) = (0.683*0.661) / (0.641+0.683*0.661) = 0.413$

The calculations above suggest that, in the model built for this present study, organizational culture and organizational change have a similar level of specific indirect effect. The former specific indirect effect was 0.402 and the latter specific indirect effect was 0.413.

Table 9: Summary of results regarding the mediation effects

Variable	MacKinnon PRODCLIN2 95% CI	
	Lower	Upper
X→ME1	.309	.871
ME1→ME2	.674	.884
ME2→Y	.431	.763
ME1→Y	.423	.753
X→ME2	.443	.821
X→Y	.451	.834

According to Table 9, the distal mediation effects, specific indirect mediation effects, direct effects and total effect are all significantly positive in the structural models in this study. The following results were derived from analyses mentioned above:

1. The leadership styles in the listed IC design houses in Taiwan exert a distal mediation effect on their organizational performances hence H2, H6 and H5 are substantiated
2. The leadership styles in the listed IC design houses significantly, positively and directly affect their organizational performances, with a 0.672 standardized path coefficient; Hence, H1 is substantiated
3. The leadership styles in the listed IC design houses in Taiwan, mediated by organizational cultures, exert a significant, specific and indirect mediating effect on organizational performances; hence, H1, H2 and H3 are substantiated
4. The leadership styles in the listed IC design houses in Taiwan, mediated by organizational changes, exert a significant, specific and indirect mediating effect on their organizational performances; hence, H1, H4 and H5 are substantiated
5. The two specific mediators, organizational cultures and organizational changes, have a similar level of specific indirect effects.

CONCLUDING REMARKS AND SUGGESTIONS

Conclusions

Conclusions were derived from the afore-mentioned data analyses and results. We find that H2, H5 and H6 are substantiated: the leadership styles in the listed IC design houses exert a distal mediation effect on their organizational performances. The conclusion is consistent with Tang (2010), Lee (2010) and Tseng (2005). Despite the different industries explored, these scholars agree that: (1) leadership styles have positive influence over organizational cultures; (2) organizational cultures have positive influence over organizational changes; (3) organizational changes also have positive influence over organizational performances. H1 is substantiated: The leadership styles in the listed IC design houses exert a significant, positive and direct effect on their organizational performances. The conclusion is consistent with Huang (2007) that leadership styles have positive and significant effects on organizational performances.

H1, H2 and H3 are substantiated: The leadership styles of listed IC design houses in Taiwan exert a significant, specific and indirect effect on their organizational performances with organizational cultures as the mediator. This finding is consistent with Chen (2003), Tang (2010), Chiu (2007) and Chung (2007). Despite the different industries explored, these scholars agree that the leadership styles positively affect organizational cultures, which in turn exert a positive effect on organizational performances. H1, H4 and H5 are substantiated: The leadership styles in the listed IC design houses in Taiwan exert a significant, specific and indirect effect on their organizational performances, with organizational changes as the mediator. This conclusion is consistent with Huang (2007), Hsu (2007), Hsiao & Chen (2008). Despite the different industries explored, these scholars agree that the leadership styles positively affect organizational changes, which in turn affect organizational performances positively. Comparison of the specific mediating effects of organizational cultures and organizational changes: The two specific mediators in this study (i.e., organizational cultures and organizational changes) have a similar level of specific indirect effects.

CONTRIBUTIONS OF THIS STUDY

Innovative applications of research method

Exploratory research enabled by multi-regression analyses accounts for a majority of the literature, leaving the CFA-based research framework with distal mediators rarely considered. Since the present study's main perspectives are implicit variables, CFA and linear SEM, but not multi-regression analysis, appear to be suitable measurement tool and model framework, respectively. Moreover, this study includes a series of analyses and tests of reliability, validity and CMV in the design of questionnaire scales and model dimensions, using relatively new statistical methods. That explains why this study is relatively innovative in terms of research method.

Contributions to the practices of taiwanese technological universities

Unlike the previous studies that were largely based on EFA, this study's author performed modeling in accordance with the summarized literature review and then verified the model's goodness-of-fit effects. The present study, consequently, is a CFA-based one addressing topics that are both important and innovative in terms of business practices, with the research results providing a reference for further studies in relevant fields, and also for the management of the companies sampled in this study seeking to improve customer values with strategic managerial decisions.

Limitations and suggestions

Considering the limited amount of research resources, simple random sampling was used to yield information from the population. However, this sampling approach may be under-representative of the population and possibly undermines the reliability of the findings. Future studies are advised to use the other sampling methods (e.g. stratified random sampling) instead. Regarding modeling for a CFA-based study like the present one, it is advisable that a simple verification model be built to avoid excessive complexity, and the subsequently poor goodness-of-fit (Chen, 2010). Despite a slightly complex model, this study decided to focus on the two mediators of organizational cultures and organizational changes to determine whether a distal mediating effect exists, and which of the two mediators has a greater specific indirect effect. Future researchers, nevertheless, may increase the number of mediators and compare their specific indirect effects. This study is focused solely on the CFA of the listed IC design houses in Taiwan. Future researchers are advised to conduct similar studies on a wider range of companies or different industries for comparative analyses of multiple groups.

Acknowledgement

For undertaking this research project we were helped by Kao Yuan University and Takming University of Science and Technology, Taiwan. We much appreciate their full support for providing us good research environment.

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