



The effects of employees' satisfaction and leadership styles on organizational performance: Organizational commitment as a dual mediator

Yu-Je Lee

Takming University of Science and Technology, Taipei City, Taiwan

I-Chao Lee and Chin-Lang Lin

Kao Yuan University, Kaohsiung City, Taiwan

Abstract

This study aims to explore the effects of employees' satisfaction and leadership styles with organizational commitment as the dual mediator on organizational performances of IC design houses listed in Taiwan. The research subjects are the managers and directors of the IC design houses listed in Taiwan. Simple random sampling is adopted. Meanwhile, this study performs Structural Equation Modeling (SEM) to validate the model fit and the imitative effect between the structural model and the measurement model. The next step is to run the Sobel Test, Bootstrapping, and Mackinnon PRODCLIN2 to test the dual mediating effect. The results suggest that in the IC design houses listed in Taiwan, (1) employees' satisfaction has positive and significant influence on organizational commitment; (2) employees' satisfaction has direct, positive and significant influence on organizational performances; (3) organizational commitment has significant influence on organizational performances; (4) leadership styles have positive and significant influence on organizational commitment; and (5) leadership styles have positive and significant influence on organizational performances. These findings in part speak of the dual mediating effect from organizational commitment. They also imply that organizational commitment plays a pivotal role in the promotion of organizational performances, although organizational commitment is by no means the only factor. It is also necessary to address other issues so as to improve organizational performances.

Keywords: Employees' satisfaction, leadership style, organizational commitment, organizational performance, dual mediation effects

Corresponding author's

Name: Yu-Je Lee

Email: pyj@takming.edu.tw

Research background & purposes

The technological advances and international specialization have contributed to the success of the Taiwanese electronics industry, known for a complete supply chain, solid technical backgrounds and global logistics management. Currently, the semiconductor industry, given its high capital and technology intensity, remains the focal point of the economic development in Taiwan. Among the countries with leading positions in the semiconductor industry, Taiwan is the only country with a vertically integrated supply chain. The government seeks to boost the productivity of the industry by establishing science parks and creating cluster effects. In fact, Taiwan is the role model for countries who seek to develop their semiconductor industries. The semiconductor industry in Taiwan is known for unparalleled competitiveness in efficiency and cost due to a comprehensive supply chain. This also provides an ideal backdrop for the booming development of IC design houses (Peng, 2009).

Given its high capital intensity, the semiconductor industry has to improve its organizational performances and upgrade core competitiveness via employees' satisfaction, leadership styles and organizational commitment in a rapidly changing knowledge economy. Over the past decade, many academic studies explore the relationship between leadership styles, organizational commitment and organizational performances. It is believed that organizational performances can achieve sustainable competitive edges.

Based on the above, this study seeks to validate and understand the effects of employees' job satisfaction and leadership styles on the organizational performances of IC design houses in Taiwan, with organizational commitment as the dual mediator. The research purposes are summarized as follows:

- (1) To test whether employees' satisfaction has positive and significant influence on organizational commitment in IC design houses listed in Taiwan;
- (2) To test whether employees' satisfaction has positive and significant influence on organizational performances in IC design houses listed in Taiwan;
- (3) To test whether organizational commitment has positive and significant influence on organizational performances in IC design houses listed in Taiwan;
- (4) To test whether leadership styles have positive and significant influence on organizational commitment in IC design houses listed in Taiwan;
- (5) To test whether leadership styles have positive and significant influence on organizational performances in IC design houses listed in Taiwan.

Literature review

The main dimensions of this study include employees' job satisfaction, leadership styles, organizational commitment and organizational performances. Below is a review of relevant literature.

Employees' satisfaction

Definition of employees' satisfaction

Robbins (1994) held that job satisfaction is a general set of work attitudes. Job satisfaction is the gap between what employees think they should get and what they actually receive as a result of their work.

Davis (1997) believed that job satisfaction is the level of preferences/dislikes employee have toward their jobs. If work characteristics are suitable, employees will experience job satisfaction.

Xu (1977) thought that job satisfaction is the feelings or emotional responses workers have toward their jobs and relevant factors. The level of satisfaction depends on the gap between the actual compensations received and the expected compensations workers think they deserve.

Wu, Pan and Ding (1980) indicated that job satisfaction is the aggregation of the gaps between expected satisfaction and actual satisfaction.

In sum, this study refers to Davis (1997) and defines job satisfaction as the level of preferences/dislikes employees have toward their jobs and the level of satisfaction concerning the gap between the compensation employees think they deserve and the compensation they actually receive.

Measurement dimensions of employees' satisfaction

Vroom (1964) contended that job satisfaction consists of seven dimensions, i.e. organizations, promotions, job descriptions, line managers, monetary compensations, work environments, and colleagues.

This study uses the definition articulated with Job Descriptive Index (JDI) proposed by Smith, *et al.* (1969). This definition, widely adopted by follow-up researchers, is concise and specific, and contains five elements, i.e. work, promotions, salaries, supervisors, and colleagues. Job satisfaction reflects the emotional responses workers have toward these five dimensions. This study refers to this definition of job satisfaction as a key variable (Fan, 2006).

Based on the above, this study refers to Smith, *et al.* (1969) for the five dimension of job satisfaction as the measurement dimension.

Leadership styles

Definition of leadership

Robbins (2001) suggested that leadership is the ability to steer an organization and groups toward a common goal.

Dubrin (2001) argued that leadership is the ability to inspire members so that they are confident and able to achieve the goals for the organization.

Fry (2003) indicated that leadership is way to encourage members with means and strategies so that they can develop and fulfil their potentials.

Bruce and Kathleen (2006) thought that leaderships should allow for the diversity of organizational members. Leaders achieve the shared goals and values via innovation and non-destructive methods. Organizations can offer internal training and necessary resources and support to facilitate the development of members and drive toward the organizational goals.

Based on the above, this study adopts the definition of leadership by Fry (2003).

Measurement dimension of leadership styles

Mintzberg (1998) believed that leaders do not adopt the leadership styles most suitable to their own personalities. Rather, they resort to the methods most appropriate to the current business environment and organizational needs. Farkas and Wetlaufer (1996) conducted interviews with top executives from the leading 160 global firms and generalize the following leadership styles considered to be outstanding: (1) the Strategy Approach: top-down resource allocations and management, focus on the creation and design of mid-to-long-term plans and confirmation of the plan feasibility; (2) the People-Asset Approach: more time spent on human resources planning and recruitment, focus on corporate cultures and values and the identification with such cultures and values from employees, and an emphasis on career planning of employees; (3) the Expertise Approach: the identification of the strongest strengths throughout the organization and the development of such strengths into the source of competitive advantages; and (4) the Control or Box Approach: the emphasis on the achievement of corporate culture/philosophy and financial metrics with a set of rules and control mechanisms to ensure the expected outcomes between customers and employees.

House (1971) thought that leadership styles are the supposed path a leader takes his/her subordinates toward goals. It is about the option for the leadership behavior models most useful to their subordinates so that they achieve personal and group targets. These four leadership styles are: (1) directive: the provision of work-specific instructions by leaders, the management with definite policies and frameworks, and the communication regarding job roles and requirements for team members after decisions from leaders; (2) supportive: update of requirements by leaderships for direct subordinates with leaderships being friendly, amicable and treating all employees equal; (3) participative: suggestions required from subordinates with leaders consulting with subordinates or asking for their feedback and such suggestions put into serious consideration before decision-making; and (4) achievement-oriented: set-up of challenging goals for work teams by leaders and the teams awareness that they are expected to perform (Hsu, 2007). Cheng (2011) divides leadership styles into (1) transactional leadership; (2) Laissez faire leadership; (3) authoritative leadership; (4) transformational leadership and (5) situational leadership.

Li (2002) indicated that leadership styles can be classified as the follows: (1) transactional leadership: enabling of subordinates to understand their roles and to accomplish the tasks assigned by leaders; (2) Laissez faire leadership: avoidance of leadership or decision-making responsibilities and the requirement of employees to complete tasks on their own, often with the assistance from other colleagues or teams to achieve organizational goals; and (3) transformational leadership: inspiration of subordinates to drive for excellence so that they move one level up regarding job needs and psychological status (Bass, 1985).

Based on the above, this paper refers to Dubrin (2001) and Li (2002) for the operational definition and classifications of leadership.

Organizational commitment

Definition of organizational commitment

Staw(1981) defined organizational commitment from the perspective of behavior. It is a process of not giving-up when people are confronted to make an irrevocable decision.

Allen & Meyer (1990) defined organizational commitment as the emotional attachment toward an organization and the costs/risks perceived regarding the departure from the organization. It is also a moral commitment, i.e. the responsibility and obligation an individual feels about the employer. Meanwhile, Allen & Meyer (1990) argued that organizational commitment is a multiple construction and can be divided into personal emotions, costs and risks perceived and social relationships. Organizational commitments can be decomposed into (1) affective

commitment: the level of emotional attachments toward an organization; (2) continued commitment: perceived costs and risks regarding the departure from the organization; and (3) normative commitment: a moral commitment, i.e. the responsibility and obligation felt toward the organization.

Tsai (1999) defined organizational commitment as the identification with the organization and willingness to make extra efforts for the organization to achieve organizational goals.

Robbins (2001) believed that organizational commitment is the level of loyalty to and identification with an organization, as well as the involvement in organizational activities.

Based on the above, this study adopts the definition of organizational commitment by Tsai (1999) and the three sub-dimensions, i.e. affective commitment, continued commitment and normative commitment, developed by Allen & Meyer (1990) as the measurement of organizational commitment.

Organizational performances

There is extensive literature elaborating on the measurement dimensions of organizational performances but the ultimate benefits are eventually reflected on financials. Therefore, most scholars refer to financials as one of the indicators. In addition, Ling and Hung (2010) suggested that organizational performances are the results accomplished by relevant divisions and departments before deadlines to achieve stage or overall goals of an organization.

Huang (2008) used financial growth and profitability metrics for the evaluation of organizational performances. Such metrics include above-industry EPS, ROE or ROA (Ling and Hung, 2010).

Based on the above, this study refers to Huang (2008) and Ling and Hung (2010) for the use of EPS and ROE to assess the financial aspects of organizational performances.

Employees' satisfaction and organizational commitment

Fan (2006) thought that (1) the satisfaction with interpersonal relationships among tech personnel has positive and significant influence on affective commitment; (2) the satisfaction with interpersonal relationships among tech personnel has positive and significant influence on professional commitment; (3) the satisfaction with autonomy among tech personnel has positive and significant influence on emotional commitment; and (4) the satisfaction with autonomy among tech personnel has positive and significant influence on professional commitment.

Lee and Shen (2008) contended that organizational structures and job satisfaction have positive and significant effects on work performances and organizational commitments.

Dai (2010) believed that job satisfaction exhibits positive effects on organizational commitment.

Whilst the abovementioned literature examines different industries, scales or scopes, there is a degree of consensus. Therefore, this paper develops the following hypothesis:

H₁: Employees' satisfaction has positive and significant influence on organizational commitment in IC design houses listed in Taiwan.

Employees' satisfaction and organizational performances

Lu (2007) supported in part the hypothesis that there is positive relationship between employees' satisfaction and organizational performances. Inner satisfaction reports positive and significant influence on financials, customers, internal workflows, learning and growth; whereas external satisfaction shows positive and significant influence on internal workflow, learning and growth.

Lee and Shen (2007) suggested that organizational structures and job satisfaction have positive and significant influence on work performances and organizational commitment.

Li and Lu (2013) argued that the stronger the sense of organizational fairness among employees, the better the relationship performances. Work satisfaction is a complete mediator between the sense of organizational fairness and relationship performances.

Based on the above literature analysis, this study develops the following hypothesis:

H₂: Employees' satisfaction has positive and significant influence on organizational performances in IC design houses listed in Taiwan.

Organizational commitment and organizational performances

Steers (1977) is the first scholar that developed a model on the effects of organizational commitment on work performances. Mowday, Porter, and Steers (1982) believed that organizational structures could influence work performances via organizational commitment. Finally, Mathieu and Zajac (1990) came up with a complete model that describes the mediating effects of organizational characteristics and job satisfaction on work performances with organizational commitment as a mediator. In fact, organizational structures are one of the organizational characteristics.

Fun (2001) indicated that attitudinal and exchangeable organizational commitment from teachers contributes to solid organizational performances of schools.

Chou (2005) pointed out a positive and significant relationship among organizational commitment, organizational learning, and organizational performances.

Chao (2007) suggested that employees can enhance the awareness of organizational changes via organizational commitment. This strengthens employees' commitment toward their organization and hence boosts their work performances.

On the basis of the above literature review, this paper develops the following hypothesis:

H₃: Organizational commitment has positive and significant influence on organizational performances in IC design houses listed in Taiwan.

Leadership styles and organizational commitment

Pu, Huang and Guo (1999) held that work values, leadership styles, job satisfaction and organizational commitment show significant correlations between most of the relevant dimensions.

Lai (2004) suggested that most of the dimensions of leadership styles are positively and significantly correlated with those of organizational commitment.

Tseng *et al.* (2007) believed that leadership styles cannot directly affect employees. Rather, the effects of leadership styles are materialized on organizational performances via organizational commitment.

Whilst the abovementioned literature examines different industries, scales or scopes, there is a degree of consensus. Therefore, this paper develops the following hypothesis:

H₄: Leadership styles have positive and significant influence on organizational commitment in IC design houses listed in Taiwan.

Leadership styles and organizational performances

Sun (2001) argued that highly considerate and highly structure leadership style or higher transformational and highly transactional leadership style result in leadership performances.

Chiang (2008) suggested that leadership styles and organizational performances are significantly correlated.

Huang (2009) indicated that in the context of leadership styles, charismatic teachings, spiritual inspirations, intellectual stimuli and individual concerns all exhibit significant influence on work performances. Among them, charismatic teachings are the most effective.

Whilst the abovementioned literature examines different industries, scales or scopes, there is a degree of consensus. Therefore, this study developed the following hypothesis:

H₅: Leadership styles have positive and significant influence on organizational performances in IC design houses listed in Taiwan.

Methodology

Research structure

Based on the above research purposes, hypotheses and literature review, this paper comes up with the following research structure.

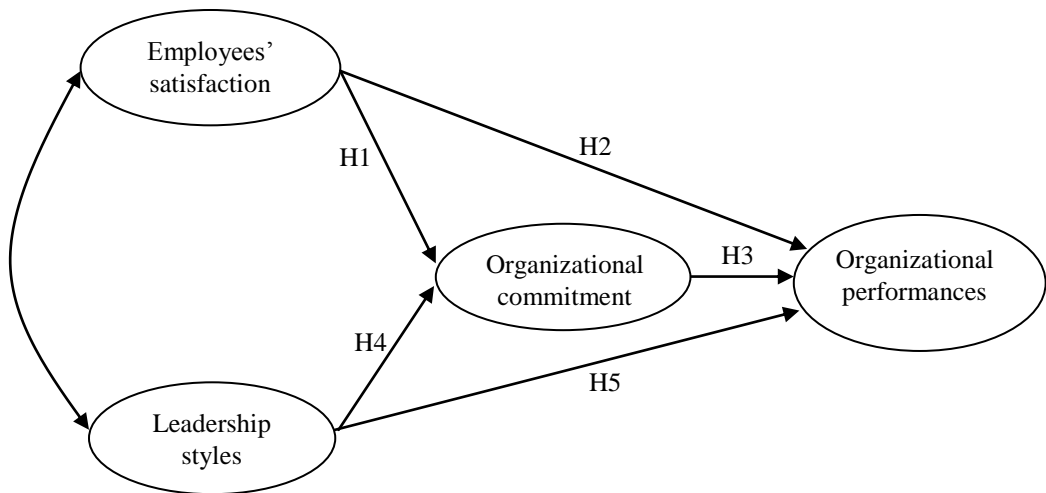


Figure 1: Research structure

Questionnaire design and CMV test

Questionnaire design

This paper uses simple random sampling for the questionnaire survey. To enhance the content validity and reliability of the questionnaire, this study conducted an expert questionnaire based on the initial questionnaire design for a pilot test. Inappropriate questions were either modified or deleted before the post test. The questionnaires were issued to managers and directors working in IC design houses listed in Taiwan. A total of 520 questionnaires were posted, and 202 effective

questionnaires, or at 38.85% effective recovery rate, were collected after the elimination of incomplete and invalid questionnaires.

All the measurable dimensions in the questionnaire were evaluated separately in individual section. The measurement is based on Likert's scale of 1~7, with 7 indicating "extreme agreement" and 1 indicating "extreme disagreement". The stronger the level of agreement, the higher the score is (Fritz and Mackinnon, 2007).

The design of the questionnaire section concerning employees' satisfaction is based on the five dimensions proposed by Smith, *et al.* (1969) for employees' satisfaction. These five dimensions are work, promotions, salaries, supervisors and colleagues. A total of 10 questions were developed.

The design of the questionnaire section on leadership styles is on the basis of the perspectives of Li (2002), who divided leadership styles into transactional leadership, fair leadership and transformational leadership. A total of nine questionnaires were developed covering these three sub-dimensions.

The design of the questionnaire section on organizational commitment was referenced to the classification by Allen & Meyer (1990). A total of nine questions were developed to cover the three sub-dimensions, i.e. affective commitment, continued commitment and normative commitment.

The measurement of organizational performances is a reference to the financial dimension elaborated by Huang (2008) and Ling and Hung (2010). The dimension indicators for organizational performances are EPS and ROE. This study designed and modified the questionnaire section, which consists of six questions.

CMV test

This paper takes into account how to reduce common method variances at the initial stage of the questionnaire design and survey. After the completion of CFA, this paper performs Haman's single-factor test and single-factor confirmatory factor analysis (i.e. CMV test for single-factor CFA) to examine the presence of common method variances. In other words, this paper performs chi-squared tests. If the variances are statistically significant, it is possible to state that the common method variances are not significant (Chang and Zheng, 2012).

SEM and measurement system

To validate the research structure, this paper adopts Structure Equation Modeling (SEM) for Confirmatory Factor Analysis (CFA). The questionnaire measures four latent variables, i.e. employees’ satisfaction, leadership styles, organizational commitment and organizational performances. Each latent variable can be divided into secondary variables, for which multiple questions are developed. The collated survey data is processed and the data file for the questionnaire responses is established. Whilst the questionnaire is designed into individual sections for the measurement system of the research model, this paper performs dual measurements in order to facilitate software processing (Chen, 2010). Table 3 summarizes the number of questions and reference sources of individual implicit variables and explicit variables (Lea, 2011).

Table 1: Questionnaire structure

Implicit dimension	Explicit dimension	No. of questions	References
Employees’ satisfaction	Work	2	Smith, Kendell & Hulin (1969)
	Promotions	2	
	Salaries	2	
	Supervisors	2	
	Colleagues	2	
Leadership styles	Transactional	3	Li (2002)
	Faire	3	
	Transformational	3	
Organizational commitments	Affective	3	Allen & Meyer (1990)
	Continued	3	
	Normative	3	
Organizational performances	EPS	3	Huang (2008); Ling and Hung (2010)
	ROE	3	

Linear structural model

Confirmatory Factor Analysis (CFA) is a type of analysis in contrast with Exploratory Factor Analysis. This paper conducts pair wise CFA on the four dimensions, i.e. employees’ satisfaction, leadership styles, organizational commitment and organizational performances. Structural equation modeling (SEM) consists of structural modeling and measurement modeling. It can effectively solve the causal relationship between explicit variables. Hence, this paper sets out to examine three elements of the model: (1) the compliance of the fit measurement for the overall model with the requirement; (2) the fit of the measurement model and (3) the fit of the structural model (Lea, 2011).

Research analysis & findings

Overall fit tests

After the literature review and the factor analysis on sampled data, this paper constructs the overall model and, as suggested by Hair et al (1998), classifies the measurement of the overall model fit into three categories, i.e. measures of absolute fit, increment fit and parsimonious fit. Table 2 shows the results of the overall fit tests (Chen, Fang, Chen & Chien, 2008).

Table 2: Overall fit tests

Fit measures		Criteria	Research results
Absolute fit	GFI	>0.9	.903
	AGFI	>0.8	.900
	RMR	<0.05	.027
Increment fit	NFI	>0.9	.902
	CFI	>0.9	.901
Parsimonious fit	PNFI	>0.5	.613
	PGFI	>0.5	.611

Measurement system within model

The factor loading of latent (implicit) variables (i.e. main dimensions) and manifest (explicit) variables (i.e. sub-dimensions) measures the strength of linear correlation between individual latent variables and manifest variables. The closer the factor loading is to 1, the better the measurement variable (or sub-dimension variable) can evaluate the main dimension. All the factor loading values of individual dimensions in this paper are greater than 0.7, indicating strong reliability. Therefore, all the sub-dimensions (manifest variables) in the measurement system can appropriately evaluate the main dimensions (latent variables). Meanwhile, Average Variance Extracted (AVE) expresses the explanatory power of latent variables on measured items. The higher the AVE, the better reliability and convergent validity the latent variables are. Usually, the AVE value must be greater than 0.5, indicating the explained variance of the dimension concerned is greater than measurement error (Fornell and Larcker, 1981). All the factor loading values in this paper are higher than 0.7, Composite Reliability (C.R.) and Cronbach's α also greater than 0.7. All the AVE values exceed 0.5, suggesting the latent/implicit variables carry high reliability and convergent validity (Table 2, Table 3 and Figure 4).

Table 3: Criteria for measurement system in model

Main dimension	Sub-dimension (or measurement)	Factor loading	Composite Reliability, C. R.	Cronbach's α	Average Variance Extracted
Employees' satisfaction (X)	Work	0.837	0.839	0.822	0.673
	Promotions	0.842			
	Salaries	0.851			
	Supervisors	0.826			

	Colleagues	0.837			
Leadership styles (I)	Transactional	0.851			
	Faire	0.832	0.850	0.832	0.674
	Transformational	0.864			
	Affective	0.861			
Organizational commitment (Me)	Continued	0.863	0.872	0.861	0.682
	Normative	0.873			
	EPS	0.864			
Organizational performances (Y)	ROE	0.861	0.862	0.857	0.666

In addition, this paper refers to AVE to determine discriminant validity of individual dimensions. Fornell and Larcker (1981) believe that the AVE of each dimension should be greater than the squared value of the coefficient of the dimension in question in order to validate the discriminant validity between the dimensions. Table 4 indicates the presence of discriminant validity between the dimensions such as employees’ satisfaction, leadership styles, organizational commitment, and organizational performances.

Table 4: Estimates of confidence interval for discriminant validity

Parameter	Estimate	$\Psi=2\sigma$		Bias-corrected		Percentile method	
		Lower	Upper	Lower	Upper	Lower	Upper
X ↔ Me	.492	.371	.582	.362	.563	.382	.584
Me ↔ Y	.563	.422	.683	.401	.671	.412	.684
X ↔ Y	.521	.481	.592	.471	.582	.471	.593
I ↔ Me	.481	.421	.573	.416	.562	.414	.591
I ↔ Y	.562	.433	.701	.424	.691	.424	.712

Coefficient of determination

Coefficient of determination, also known as Squared Multiple Correlation (SMC), represents the explanatory power of independent variables to dependent variables. Table 5 shows that the independent variables in this paper exhibit medium levels of explanatory power on dependent variables.

Table 5: Coefficient of determination

Coefficients of determination	R ²
Employees’ satisfaction (X) → organizational commitment (Me)	0.241
Organizational commitment (Me) → organizational performances (Y)	0.316
Employees’ satisfaction (X) → organizational performances (Y)	0.243
Leadership styles (I) → organizational commitment (Me)	0.234
Leadership styles (I) → organizational performances (Y)	0.313

Path coefficients of latent variables

After the validation of the model with internal fit tests, this paper summarizes the standardized coefficients and C.R. values of individual latent (implicit) variables in Tables 6 and 7 according to the path analysis results. Figure 2 illustrates the path analysis (Leeb, 2011).

Table 6: Results of path analysis on structural model (un-standardized)

	Estimate	S.E.	C.R.	P value
Employees' satisfaction (X) → organizational commitment (Me)	0.891	0.151	5.901	***
Organizational commitment (Me) → organizational performances (Y)	0.932	0.163	5.718	***
Employees' satisfaction (X) → organizational performances (Y)	0.893	0.153	5.837	***
Leadership styles (I) → organizational commitment (Me)	0.883	0.163	5.417	***
Leadership styles (I) → organizational performances (Y)	0.893	0.131	6.817	***

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

Table 7: Standardized regression weights: (Group number 1–Default model)

	Estimate
Employees' satisfaction (X) → organizational commitment (Me)	0.491
Organizational commitment (Me) → organizational performances (Y)	0.563
Employees' satisfaction (X) → organizational performances (Y)	0.523
Leadership styles (I) → organizational commitment (Me)	0.482
Leadership styles (I) → organizational performances (Y)	0.563

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

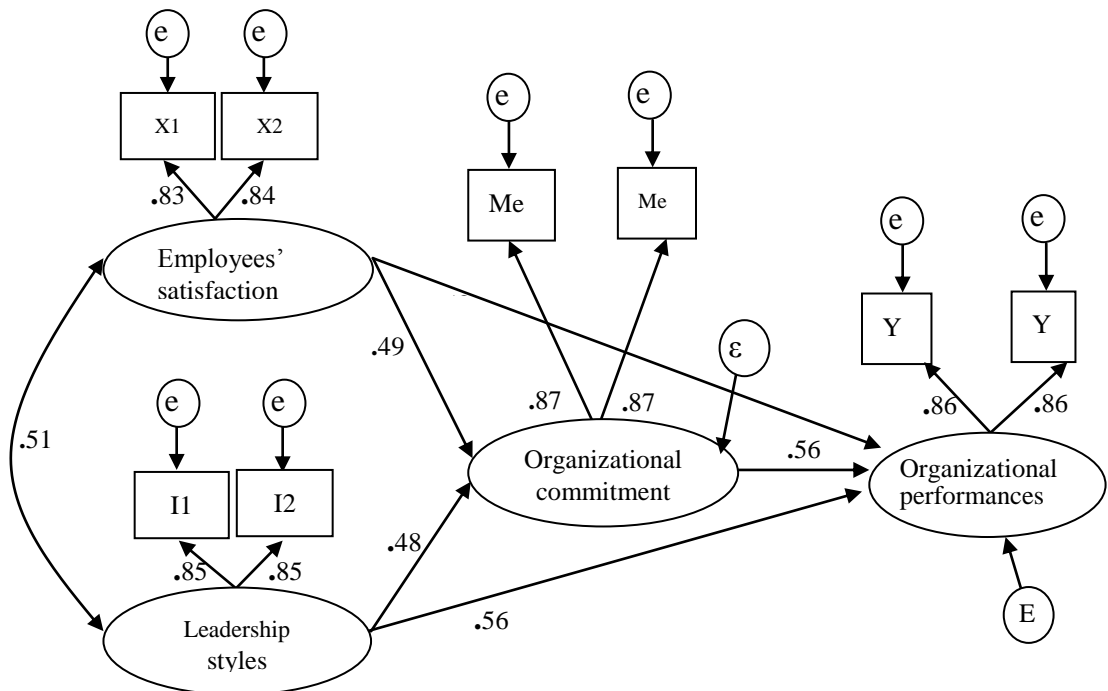


Figure 2: Standardized SEM analysis results

Path effect analysis & tests on structural model

This paper performs Sobel tests, Bootstrapping and Mackinnon PRODCLIN2 on the path coefficients of latent variables (or non-observable variables) as the path effect analysis on the path effects in the structural model. The accumulation of organizational commitment (Me) serves as a dual mediator. Test results are shown in Tables 8 and 9 (Sobel, 1982; MacKinnon, Fritz, Williams and Lockwood, 2007).

Table 8: Intervening variables (un-standardized)

Variable	Point of Estimates (Est.)	Product of Coefficients SE	Z	Bootstrapping				MacKinnon PRODCLIN2	
				Bias-Corrected 95% CI		Percentile 95% C		95%CI	
				Lower	Upper	Lower	Upper	Lower	Upper
Total Effects									
X→Me	0.89	0.15	5.90	0.78	0.98	0.73	0.99		
Indirect Effects									
Me→Y	0.932	0.16	5.72	0.32	0.96	0.31	0.94	0.37	0.98
Direct Effects									
X→Y	0.89	0.15	5.84	0.33	0.61	0.32	0.72		

Table 9: Intervening variable (un-standardized)

Variable	Point of Estimates (Est.)	Product of Coefficients SE	Z	Bootstrapping				MacKinnon PRODCLIN2	
				Bias-Corrected 95% CI		Percentile 95% C		95%CI	
				Lower	Upper	Lower	Upper	Lower	Upper
Total Effects									
I→Me	0.88	0.16	5.42	0.66	0.97	0.62	0.96		
Indirect Effects									
Me→Y	0.932	0.16	5.72	0.34	0.98	0.36	0.98	0.36	0.98
Direct Effects									
I→Y	0.89	0.13	6.82	0.33	0.92	0.31	0.93		

Based on the above mentioned, this study derives the following conclusions:

- (1) Employees’ satisfaction has positive and significant influence on organizational commitment in IC design houses listed in Taiwan. Standardized coefficient is estimated to be 0.49. Therefore, H1 is substantiated.
- (2) Employees’ satisfaction has positive and significant influence on organizational performances in IC design houses listed in Taiwan. Standardized coefficient is estimated to be 0.52. Therefore, H2 is substantiated.
- (3) Organizational commitment has positive and significant influence on organizational performances in IC design houses listed in Taiwan. Standardized coefficient is estimated to be 0.56. Therefore, H3 is substantiated.
- (4) Leadership styles have positive and significant influence on organizational commitment in IC design houses listed in Taiwan. Standardized coefficient is estimated to be 0.48. Therefore, H4 is substantiated.

(5) Leadership styles have positive and significant influence on organizational performances in IC design houses listed in Taiwan. Standardized coefficient is estimated to be 0.56. Therefore, H5 is substantiated.

These above results suggest that organizational commitment serves partly as a dual mediator. This also implies that organizational commitment plays a pivotal role in the promotion of organizational performances. However, the improvement of organizational performances takes more than just organizational commitment. It is necessary to push for performance improvements via other means.

Conclusion and suggestions

This section reaches conclusions on the basis of the above analysis and findings, and elaborates on the contribution of this paper. Finally, the research limitations are summarized and the suggestions to follow-up studies are made.

Conclusion

In sum, this paper interviews managers and directors working in IC design houses listed in Taiwan in order to develop an SEM model to validate the research hypotheses. The following is the research conclusions:

Effects of employees' satisfaction on organizational commitment in IC design houses listed in Taiwan

The research findings support H1 that employees' satisfaction has positive and significant effects on organizational commitment in IC design houses listed in Taiwan. This is in line with Fan (2006), Lee and Shen (2008) and Dai (2010).

Effects of employees' satisfaction on organizational performances in IC design houses listed in Taiwan

The research findings support H2 that employees' satisfaction has positive and significant effects on organizational performances in IC design houses listed in Taiwan. This is consistent with Lu (2007), Lee and Shen (2008) and Li and Lu (2013).

Effects of organizational commitment on organizational commitment in IC design houses listed in Taiwan

The research findings support H3 that organizational commitment has positive and significant effects on organizational performances in IC design houses listed in Taiwan. This is in agreement with Chou (2005) and Chao (2007).

Effects of leadership styles on organizational commitment in IC design houses listed in Taiwan

The research findings support H4 that leadership styles have positive and significant effects on organizational commitment in IC design houses listed in Taiwan. This is in line with Lai (2004) and Tseng *et al.* (2007).

Effects of leadership styles on organizational performances in IC design houses listed in Taiwan

The research findings support H5 that leadership styles have positive and significant effects on organizational performances in IC design houses listed in Taiwan. This is consistent with Sun (2001), Chiang (2008) and Huang (2009).

Research contributions

- (1) This study constructs a model with two causes, one effect and one mediator. The model is based on relevant studies and validated for the goodness-of-fit effects. Hence, it adopts a CFA (Confirmatory Factor Analysis) approach on an important real-life issue with an innovative approach. It is suggested that follow-up studies continue to explore relevant topics and further examinations.
- (2) This study completes a series of tests on the reliability and the validity on the model dimensions for the questionnaire and conducts CMV analysis and tests. The statistical approach and the research methodology are pragmatic and creative.

The research findings can serve as a reference to the management in IC design houses listed in Taiwan or other countries in the consideration of leadership styles, employees' satisfaction and organizational commitment, so as to drive the strategic implementation for organizational performance improvements.

Research limitations

This study suffers from limited resources, although it seeks to complete all the stages of research tasks in a manner as robust as possible. Below is a list of research limitations:

- (1) There are limited studies in Taiwan and overseas on the research dimensions developed in this study and very few papers address the pairwise dimensions as in this study. This is why the supporting data seems inadequate for hypothesis development.

(2) This study uses simple random sampling and issues the questionnaires via post. As a result, the effective recovery rate is low and the sample may not be representative of the population.

(3) Due to research resource limitations, this paper only samples the IC design houses listed in Taiwan. The research scope does not cover all the small-and-medium sized IC design houses in Taiwan.

Suggestions to follow-up studies

This study only interviews the managers and directors working in the IC design houses listed in Taiwan. To broaden the scope of data or seek innovative approaches, follow-up studies may examine the players of smaller sizes in the same IC design industry or investigate other industries for comparisons and analyses.

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