The effects of flexible manufacturing capabilities and logistics capabilities upon organizational performance: Using cloud technology investment as the moderator

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Abstract

The purpose of this study is to verify and realize, with the use of Confirmatory Factor Analysis, the interactive effects of cloud technology investment on flexible manufacturing capabilities and logistics capabilities respectively. Research subjects are the section chiefs and managers working at Taiwan-listed photovoltaic companies. The simple Random Sampling method is adopted, and Structural Equation Modeling (SEM) is used to verify the Overall Research Model, and the fitting effect of its Structural and Measurement Models. The results show that having both flexible manufacturing and logistics capabilities provides Taiwan-listed photovoltaic manufacturers' performance with a significant positive effect, while cloud technology investment also provides a positive interactive effect on a manufacturer's performance. These results are not only worthy of being the reference for subsequent researchers conducting further research on relevant fields, they can also serve as a reference for sustainable development for business decision-makers of Taiwan-listed Photovoltaic Companies.

Keywords: Flexible manufacturing capability, logistics capability, organizational performance, cloud technology investment

Research motivations & purposes

In the twenty-first century, customized products in mass quantities with flexibility will be the new production business model pursued by the manufacturing industry (Wang, 2004).

In addition, logistics capabilities affect the strength of enterprise competitiveness. The business performance derived from the operation mode that an enterprise applies to logistics management not only affects the quality of after-sale service, but also the operating synergy of the overall enterprise.

Moreover, looking back at the past few decades, the issue of using cloud technology to achieve cost savings and improve organizational performance is also one of the most important research topics of our time. Hence, it is these reasons that produce the motivations for this study. Furthermore, this study targets section chiefs and managers of Taiwan-listed photovoltaic companies as research subjects in order to verify the effects of Flexible Manufacturing

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Capabilities and Logistics Capabilities upon Organizational Performance, and to use Cloud Technology Investment as the Moderator. So this main purpose is to realize, with the application of Confirmatory Factor Analysis (CFA), the interactive effects of Cloud Technology Investment upon Flexible Manufacturing Capability and Logistics Capability respectively. Finally, this study also makes recommendations, based on these research results, to be offered to Taiwan-listed Photovoltaic Companies as a reference for improving organizational performance. In brief, the purposes of this study are as below:

(1) Verifying and realizing whether Flexible Manufacturing Capability has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies or not;

(2) Verifying and realizing whether Logistics Capability has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies or not;

(3) Verifying and realizing whether Cloud Technology Investment has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies or not;

(4) Verifying and realizing whether Cloud Technology Investment, under the existing Flexible Manufacturing Capability paradigm, has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies or not; and

(5) Verifying and realizing whether Cloud Technology Investment, under the existing Logistics Capability paradigm, has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies or not.

Literature review

To understand the research literature relevant to the topic of this study, a summarized overview of the research literature relevant to each dimension of this research topic is described as follows:

The definition and taxonomy of flexible manufacturing capability

The definition of flexible manufacturing
Buzacott (1982) believed that flexible manufacturing capability refers to the capability of a manufacturing system that effectively conquers environmental uncertainties, while Slack (1983) believed that flexible manufacturing capability refers to the production scope capability provided by a manufacturing system, where the production scope refers to the product varieties produced by a manufacturing department or the adjustment speed required for different levels of production.

Upton (1994) defined flexible manufacturing capability as the capability of a manufacturing system that allows the reaction to market demands at low cost and without compromising product quality or profit earning performance.

Wang (2004) defined flexible manufacturing capability as the capability of a manufacturing system that allows for rapid adaptation to change at a lower cost and shorter time, when facing the challenge of environmental uncertainty.

The research of Lee *et al*. (2013) suggested that the conceptual definition of flexible manufacturing capability is "under environmental uncertainty, the capability of a manufacturing system that adapts to market demands, creates a lower cost with fast delivery in response to customer demands without compromising product quality, while ensuring profitability."

The measurement dimensions of flexible manufacturing capability
Sethi and Sethi (1990) and Upton (1995) all consider that flexible manufacturing capability is made up of multi-dimensional capabilities. Reviewing existing literature, one finds that there are various perspectives in terms of the taxonomy of various dimensions of flexible manufacturing capability. This research cites a few existing publications in the following as a review:

Sethi *et al.* (1990) believed that flexible manufacturing capability is multi-dimensional. The dimensional taxonomy proposed by these scholars is often cited by a majority of scholars studying flexible manufacturing related topics, which consists of 11 sub-dimensions: (1) machine flexibility; (2) material handing flexibility; (3) operation flexibility; (4) process flexibility; (5) product flexibility; (6) routing flexibility; (7) volume flexibility; (8)expansion flexibility; (9) program flexibility; (10) production flexibility; and (11) market flexibility.

Suarez *et al.* (1995) proposed four sub-dimensions of flexible manufacturing from the perspective of manufacturing strategies: (1) mix flexibility; (2) new product flexibility; (3) volume flexibility; and (4) delivery time flexibility.

Wang (2004) divided flexible manufacturing capability into four sub-dimensions: (1) machine flexibility; (2) personnel flexibility; (3) routing flexibility; and (4) material handing flexibility.

This research adopts the definition defined by Lee, Chen and Lee (2013) as the conceptual definition for flexible manufacturing capability, and adopts the four dimensions of flexible manufacturing proposed by Suarez *et al.* (1995) as the measurement dimensions of this study.

Relevant literature for logistics capability

The definition of logistics capability
Concerning the definition of logistics capability, scholars in general define logistics capability from the multi-dimensions perspective (Wang, 2004).

Daugherty and Pittman (1995) explored logistics capability on the basis of time, and proposed that information technology and flexibility are the most important aspects of logistics capability.

Morash *et al.* (1996), in the study of investigating the relationship between Strategic Logistics Capabilities, Competitive Advantage and Firm Success, proposed that demand-oriented and supply-oriented capabilities are the two major strategic logistics capabilities.

Lee *et al*. (2013) proposed that the operational definition of logistics capability is that a company is able to prepare and deliver product or services quickly, while handling unexpected or specific customer demands.

The measurement dimensions of logistics capability
Stank and Lackey (1997) summarized logistics capability into four sub-dimensions: (1) positioning; (2) agility; (3) integration; and (4) measurement.

In the study of exploring the relationship between logistics capability and organizational performance, Liao (1999) defined logistics capability as: (1) delivery: refers to on time delivery and fast delivery, and; (2) flexibility: refers to handling unexpected or specific customer demands while providing fast delivery.

Lynch *et al.* (2000) proposed that intrinsic logistics capability should include: (1) process capabilities; and (2) value-added service capabilities.

Zhao *et al.* (2001) proposed that logistics capability includes: (1) customer focus: refers to that an enterprise is able to understand customers and meet customer demands with excellent skills from a market-oriented perspective; and (2) information focus capabilities: refers to the capabilities of applying and integrating information technology.

Wang (2004) proposed that logistics capability refers to: (1) delivery; (2) flexibility; (3) the extent of information sharing; (4) information technology; and (5) supplier relationship.

Summarizing the above, this study adopts the definition defined by Lee *et al.* (2013) for logistics capability, and adopts the dimensions proposed by Wang (2004) for its dimensions.

Relevant literature for organizational performance

The definition of organizational performance
Evans *et al.* (1996) suggested that organizational performance is the measurement of the achievement level of an enterprise's strategic objectives, and is also an indicator of overall enterprise competitiveness. An appropriate organizational performance assessment affords its manager the understanding of the status of the organization. Popular assessment indicators are income, productivity and profitability of the organization.

Xu (2007) suggested that "organizational performance" is divided into "efficiency" and "effectiveness", while Drucker (1966) provided a very good interpretation for "efficiency" and "effectiveness", that Efficiency is "doing things right"; effectiveness is "doing the right things".

Neither efficiency nor effectiveness should be neglected, but this is not to say that efficiency and effectiveness are equally important. For an organization, it is certainly preferable to improve efficiency and effectiveness at the same time; however, if both cannot be obtained, the organization should focus on effectiveness prior to aiming at improving efficiency.

The research of Lee *et al.* (2013) suggested that the operational definition of organizational performance is that it is an indicator of the overall enterprise competitiveness, and it also the measurement of the achievement level of an enterprise's strategic objectives. Meanwhile, popular assessment indicators for organizational performance are income, productivity and profitability of the organization; therefore, an appropriate organizational performance assessment affords its manager the understanding of the status of the organization.

The measurement dimensions of organizational performance
There is a massive amount of previous studies addressing the measurement dimensions of organizational performance. Since the benefits of organizational performance will eventually be fed back to the financial dimension, most scholars in this field adopt financial performance as one of the measurement indicators. In an environment characterized by convenient ways of information delivery and rapid-changing markets, nevertheless, a company nowadays shall never solely rely on financial performance to achieve survival and competitiveness. That is to say, it is impossible to sufficiently measure the organizational performance using financial performance as the single indicator.

Kaplan and Norton (1996) proposed a BSC system comprising four perspectives as the following: (1) the financial perspective; (2) the customer perspective; (3) the internal-business-process perspective; and (4) the learning-and-growth perspective.

In addition, according to Ling and Hung (2010), in order to gauge both the financial and non-financial prospective of organizational performance and to correctly measure the effect of job

satisfaction and internal-service quality upon organizational performance, financial performance should be defined as the output in terms of financial accounting that can be measured by indices with regard to growth and profitability.

From the above, this study applies the operational definition proposed by Lee *et al.* (2013) for the definition of Organizational Performance. However, as for the measurement dimensions of Organizational Performance, this study uses a combination of measurement dimensions proposed by Ling *et al.* (2010) as well as Kaplan *et al.* (1996), i.e.: (1) Financial Performance: using EPS as the measurement indicator; and (2) Non-Financial Performance such as (A) Customer Perspective; (B) Internal-Business-Process Perspective; and (3) Learning-and-Growth Perspective.

Cloud technology

The term "cloud" first appeared in the 1990's. It was commonly denoted with the image of "cloud", which is still in use today, to represent the entire internet. The web-based services of Amazon started at around the year 2000, providing services to readers, while Yahoo and Google started offering cloud computing around 2006 to a few well-known colleges for use in the development of new internet services (Zhang *et al.,* 2010).

While "cloud computing" may have been merely a concept, the great enhancements of bandwidth speed of the internet network enables the operation of such an idea. In other words, "cloud computing" is a mode of information flow that provides the freedom of access and storage, just like water or electricity. Users can obtain water and electricity from the supplies of water plant and power plant, simply by turning on the faucet or plugging into a socket at home without the need of building their own water tower or a generator. Additionally, the formation of "cloud computing" is a new creation of, and an ecological change of the ICT industry, enabled by the substantial improvement in the delivery of information flow of the internet network. The reason it is called "cloud computing" is that, in a computer flow chart, the internet network is usually represented by a cloud shape image. Thus the computation delivered to remote large-scale virtual host computers through internet networks is called "cloud computing". The service models derived from cloud computing are: (1) Infrastructure as a Service (IaaS); (2) Platform as a Service (Paas); and (3) Software as a Service (SaaS). Therefore, services offered by "cloud computing", whether they be infrastructure and/or software, may render a lower cost-investment in fixed assets, lower software costs, personnel costs and reduce operating costs for small to medium sized enterprises (SME) that lack inherent resources, thereby promoting better efficiency for the SMEs (Cai 2010).

Furthermore, Yong-Ben (2011) suggested that the so-called "cloud technology" refers to activities enabled through the use of the internet network that range from email, file transfer, remote registration communication, remote dialog, or taking online courses, information researching, video viewing, merchandize marketing, personal blogs, and others. Zhang (2011) believed that the concept of "cloud technology" is turning large amounts of data into information through calculation, then turning information into knowledge through "learning by doing", subsequently turning knowledge into wisdom by applying methodologies. Chen (2011) pointed out that "cloud technology" is an intelligent management method that enhances performance. While stimulating employees' potential, management must reduce the factors of interference with the employees, so that they may continuously innovate, learn how to integrate through failure, and detach from the methods to which previously so attached (Merit Times, 2011).

The study of Lee (2012) suggested that the conceptual definition of cloud technology investment is "Using the Internet to configure a Cloud Computing environment as a virtual environment, which for example has proven to provide good access to Telecare platforms, are effective and

flexible network architecture. That is the investment for Cloud Computing Technologies". In this study, the dimension of cloud technology investment is divided into three aspects: (1) Internet teaching; (2) Network database; and (3) Network software and hardware equipment.

Summarizing the above, this study adopts the conceptual definition defined by Lee (2012) for Cloud technology investment, and the dimensions of Cloud Technology Investment are: (1) Network database; and (2) Network software and hardware equipment.

In conclusion, this study aims to understand "the positive effects of flexible manufacturing capability on organizational performance", and "the positive effects of logistics capability on organizational performance", using "organizational performance" as the base, and cloud technology investment as the extraneous variable. In other words, whether cloud technology investment, under the existing flexible manufacturing capability and logistics capability paradigm, has a significant multiplying effect on the organizational performance of Taiwan-listed photovoltaic companies. Hence, this study proposed following hypotheses:

Hypothesis 1: (H_1) Flexible Manufacturing Capability has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies.
Hypothesis 2: (H_2) Logistics Capability has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies.
Hypothesis 3: (H_3) Cloud Technology Investment has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies.
Hypothesis 4: (H_4) Under the existing Flexible Manufacturing Capability paradigm, Cloud Technology Investment has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies.
Hypothesis 5: (H_5) Under the existing logistics capability paradigm, Cloud Technology Investment has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies.

Methodology

From the above-mentioned Research Motivations, Purposes and Literature Review cited led to Conceptual Research Framework as shown in Figure 1:
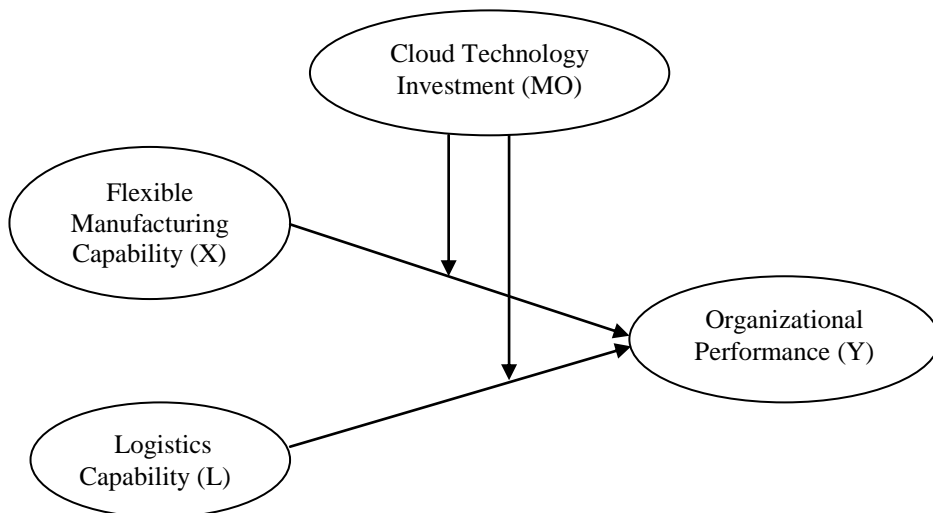

Figure 1: Conceptual research framework

Research framework - statistics concept

Designing the questionnaire

This study questionnaire adopted seven-point Likert Scale. As we know, Fritz and Mackinnon (2007) pointed out the answers, on a seven-point Likert Scale, were measured with "7" denoting Strongly Agree and "1" denoting Strongly Disagree. A higher score represents a greater level of agreement, and vice versa.

Besides, the "Itemization Measurement" method was adopted in this questionnaire and it was also compiled on the basis of the afore-mentioned observable dimensions. Moreover, the sample data collected was then "centralized", so the sum of scores given to all questionnaire items is zero after deducting the average. Centralization erases multicollinearity between the independent and moderators/extraneous variables, in order that their interactions are tested more accurately, as shown in the mathematical equation below:

$$\Sigma(Y_i - \bar{y}) = \Sigma X_i = 0$$

Regarding the questionnaire design of "flexible manufacturing capability", this study adopts the four dimensions proposed by Suarez *et al.* (1995), and follows the method of Itemization Survey to design the questionnaire. With each variable comprising two questions, the questionnaire presents a total of eight questions.

As for the questionnaire design of "logistics capability", this study adopts the five dimensions proposed by Wang (2004), and follows the method of Itemization Survey to design the questionnaire. With each variable comprising two questions, the questionnaire presents a total of ten questions.

Regarding the questionnaire design of "organizational performance", this study adopts the measurement dimensions proposed by Ling *et al.* (2010), as well as Kaplan and Norton (1996), i.e.: (1) financial performance: using EPS as the measurement indicator; and (2) non-financial performance: i.e. "customer dimension", "internal-business-process dimension", and "learning-and-growth dimension". There are a total of 12 questions on the questionnaire.

As regards the questionnaire design of "cloud technology investment", this study adopts the theory proposed by Lee (2012) and designs the dimensional variables, where there are four questions concerning Network Database, and four questions for Network Software and Hardware Equipment, a total of eight questions.

In addition, this study adopts SEM with Confirmatory Factor Analysis (CFA), and bases the questionnaire design on four latent variables such as flexible manufacturing capability, logistics capability, cloud technology investment and organizational performance, each of which is divided into observable sub-variables containing several questions. After processing the collected data, this study creates a primary file that precedes the design of questionnaire, using Multi-Dimension Measurement for the construction of this study's measurement system. Chen (2010) mentioned though "Itemization Measurement method" was applied to the design of the questionnaire, "Double Measurement" was adopted to ensure the computer software efficiently handled and/or measured all data. So "Double Measurement" is also adopted in this study.

CMV test

Using CFA to test and compare, Common Method Variance does not exist in the questionnaire designed by this study. Results are shown in Table 1.

Table 1: CMV test results

Model	χ^2	DF	$\Delta\chi^2$	ΔDF	P
Single Factor	1337.7	97	895. 4	99	0.000
Multiple Factors	442.3	196			

Sampling method

As for the sampling, this study uses a Simple Random Sampling method; besides, for better content reliability and validity, "Expert Questionnaire" was given out after the questionnaire was designed and then performing "pilot-testing" for which the unsuitable items were revised or removed. Finally, 500 copies of questionnaire were sent in a "post-test" to the section chiefs and managers working at Taiwan-listed photovoltaic companies. After collecting the replies and removing those with incomplete or invalid answers, 202 out of the 500 questionnaire copies given out were returned valid; hence, the effective response rate is 40.4%.

Theory basis of the study- CFA and SEM

This study uses a CFA, an analytical method contrary to the Exploratory Factor Analysis (EFA), on the four latent variables of flexible manufacturing capability, logistics capability, cloud technology investment and organizational performance.

Diamantopoulos & Siguaw (2000) pointed out SEM is made up of structural and measurement models to efficiently tackle the cause-effect relations among latent variables.

According to Diamantopoulos *et al.* view-point, 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 research model's conformity with goodness-of-fit indicators. In other words, goodness-of-fit indictors were applied to a test of the overall goodness-of-fit effect of SEM.

Results and analysis

Analyzing fit of this measurement model

Factor loading is intended to gauge the intensity of linear correlation between each latent variable and an observable one, and the closer the factor loading is to "1", the better an observable variable is in measuring latent variables.

As this study's reliability is supported by the fact that factor loadings for all observable variables range between 0.7 and 0.9 (Table 2), all observable variables in the measurement model appropriately measured the latent ones. The Average Variance Extracted (AVE), on the other hand, measures a latent 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 latent variable. Fornell and Larcker (1981) pointed out, as a rule, AVE has to be larger than 0.5 for an observable variable's explainable variance to exceed the measurement error.

Finally, we can get the results that all AVEs in this study exceed 0.5, the observable variables have excellent reliability and convergent validity as shown in Table 2 and Figure 2. These also show that Common Method Variance does not exist in the questionnaire designed by this study as mentioned-above.

Table 2: Judgment indicators for the measurement model

Unobservable variables (Implicit Variables)	Observable Variables: Centralized Dual Measurement	Factor loading	Average Variance Extracted, AVE
Flexible Manufacturing Capability (X)	X_1C	0.86	0.62
	X_2C	0.87	0.56
Logistics Capability (L)	X_1C	0.85	0.62
	X_1C	0.86	0.57
Cloud Technology Investment (MO)	MO_1C	0.83	0.59
	MO_2C	0.82	0.58
X*MO	X_1MO_1C	0.75	0.67
	X_2MO_2C	0.78	0.68
L*MO	L_1MO_1C	0.76	0.68
	L_2MO_2C	0.73	0.65
Organizational Performance (Y)	Y_1C	0.83	0.59
	Y_2C	0.85	0.58

Analyzing fit of structure model

Path analysis results of the structure model
Form path analysis, it shows that the Structure Model passes the goodness-of-fit test before calculating the parameter estimates.

Estimate, Standard Errors (S.E.) and Critical Ratio (C.R.) among latent variables are as shown in Table 3. Additionally, Table 3 also indicates that under the existing Flexible Manufacturing Capability, Cloud Technology Investment has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies, and that under the existing Logistics Capability; Cloud Technology Investment has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies etc. Especially, Cloud Technology Investment has positive moderating effects that promote Organizational Performance to achieve multiplied synergy that it has a really significant meaning.

Table 3: Path analysis results of the structural model

Path Coefficients between Latent Variables			Estimate	S.E.	C.R.	P	Label
Flexible manufacturing capability (X)	→	Organizational performance (Y)	0.432	0.091	4.747	***	a
Logistics capability (L)	→	Organizational performance (Y)	0.331	0.092	3.598	***	b
Cloud technology investment (MO)	→	Organizational performance (Y)	0.412	0.022	18.727	***	c
X*MO	→	Organizational performance (Y)	0.691	0.023	30.043	***	d
L*MO	→	Organizational performance (Y)	0.671	0.021	31.952	***	e

Note: *** denotes P<0.001

Coefficient of determination
The explanatory level of each latent independent variable to each latent dependent variable is R^2 value that is also called Squared Multiple Correlation, SMC. Hence, the adjusted R^2 value shown in Tables 4 and 5 indicate that the latent independent variable has adequate explanatory ability upon the latent dependent variable respectively.

Table 4: Coefficients[a]

Model	R	R Square	Adjusted R Square	Sid. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.886[a]	0.785	0.761	6.916	0.024	179.213	2	97	0.000
2	0.893[b]	0.797	0.754	6.711	0.043	7.022	1	96	0.004

a. Predictors: (Constant), MO, X and L
b. Predictors: (Constant), MO, X, L, X *MO and L*MO

The following Table 5 was derived from Table 4:

Table 5: Coefficients[b] of determination

Coefficients of determination	Adjusted R^2
Flexible manufacturing capability (X), logistics capability (L), and cloud technology investment (MO) on organizational performance (Y)	0.761
Flexible manufacturing capability (X), logistics capability (L), cloud technology investment (MO), X*MO and L*MO on organizational performance (Y)	0.754

Indices of fit of the overall research model

As the above mentioned, this study adopts SEM for modeling in order to verify how latent 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.

Since χ^2, d.f., GFI, AGFI, NFI, CFI, RMR and RMSEA are the goodness-of-fit indicators for the overall model as Schumacker and Lomax (2004) stated, it is usually required that χ^2/d.f. <5, 1>GFI>0.9, 1>NFI>0.9, 1>CFI>0.9, RMR<0.05 and RMSEA<0.05 as Bagozzi & Yi (1988) proposed.

In this study, the Overall Research Model has a satisfactory goodness-of-fit effect because χ^2/d.f. <5 and the values of GFI, AGFI and NFI all exceed 0.90, with a below 0.05 RMR, as shown in Table 6.

Table 6: Indices of fit of the overall research model

Determination index	χ^2	DF	GFI	NFI	AGFI	CFI	RMR	RMSEA
Fit value	46.914	39	0.904	0.903	0.911	0.904	0.022	0.021
Criteria	χ^2/df<3		>0.9	>0.8	>0.9	>0.9	<0.05	<0.05

Standardized results of SEM analysis

In accordance with Standardized Results of SEM Analysis, the model's overall framework resulted from computer-aided is as shown in Figure 2 (The SEM model belongs to "Two independent variables, one dependent variable with one moderator model").
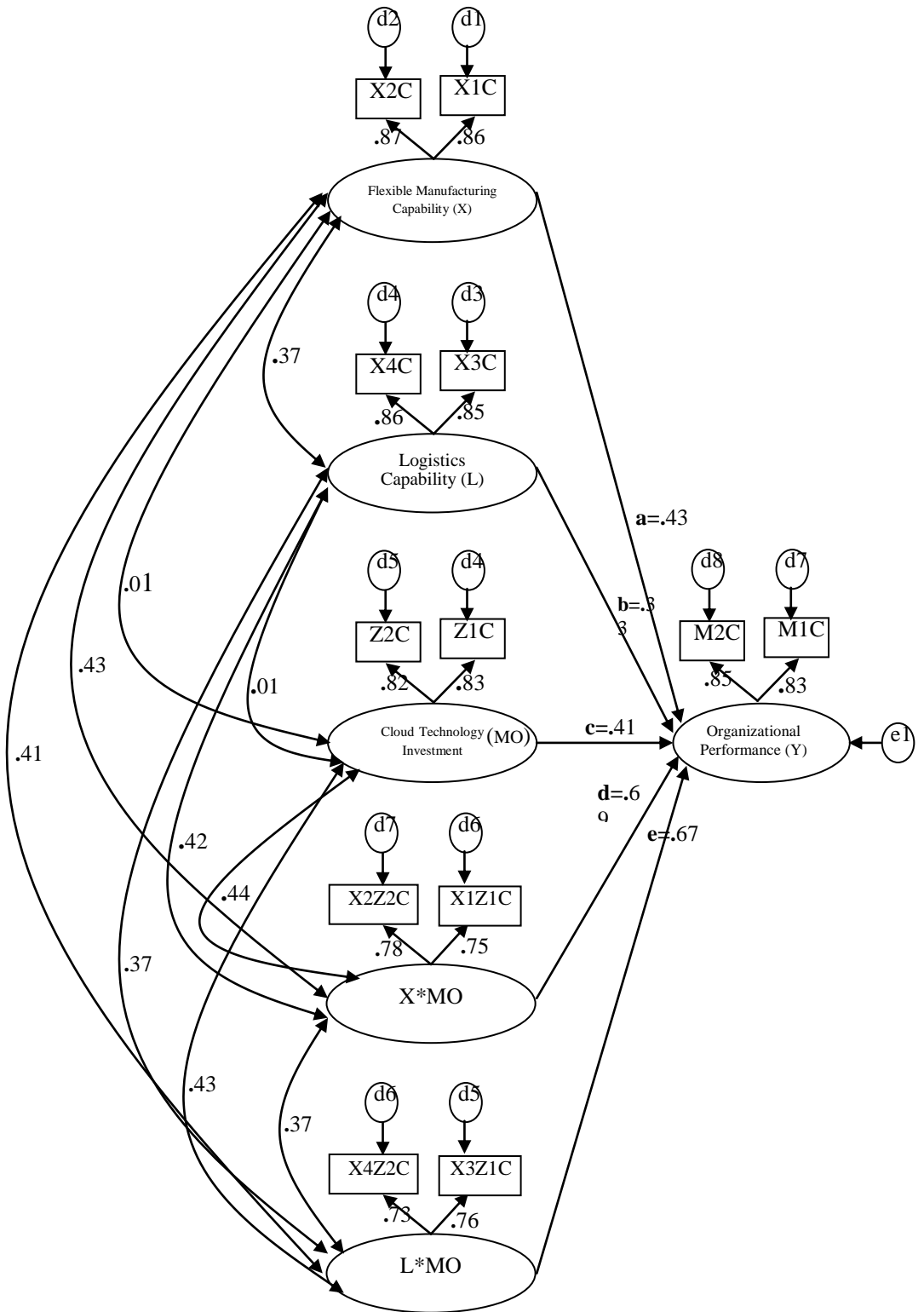
Figure 2: Standardized results of SEM analysis

Analytical testing of path effects for the structural model

To examine the moderator, this study performs a hierarchical regression analysis, followed by Centralized regression analyses and t-tests of Y versus X, MO and X*MO in order to verify whether the hypothesis about a significant regression coefficient c was substantiated; i.e. whether c is zero or not. The results are shown in Table 7.

Table 7: Analytical testing of path effects for the structural model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	13.709	0.681	0.621	20.131	0.000
X	8.021	0.814	0.432	9.854	0.000
L	8.113	0.823	0.331	9.858	0.000
MO	6.982	0.410	0.412	17.029	0.000
X*MO	10.402	0.533	0.691	19.516	0.000
L*MO	10.431	0.531	0.671	19.644	0.000

a. Dependent variable: organizational performance (Y)

From Table7 and Figure 1, we can see that the 0.691 Path Coefficient of X*MO versus Y, and the 0.671 Path Coefficient of L*MO versus Y which denote a moderating effect of X*MO and L*MO upon Y.

The following results were derived from analyses mentioned above:

(1)   Flexible Manufacturing Capability affects Organizational Performance of Taiwan-listed photovoltaic companies in a significantly positive way, with a 0.43 standardized path coefficient that supports H_1 (Hypothesis substantiated);

(2)   Logistics Capability affects Organizational Performance of Taiwan-listed photovoltaic companies in a significantly positive way, with a 0.33 standardized path coefficient that supports H_2 (Hypothesis substantiated);

(3)   Cloud Technology Investment affects Organizational Performance of Taiwan-listed photovoltaic companies in a significantly positive way, with a 0.41 standardized path coefficient that supports H_3 (Hypothesis substantiated);

(4)   Under the existing Flexible Manufacturing Capability paradigm, Cloud Technology Investment affects Organizational Performance of Taiwan-listed photovoltaic companies in a significantly positive interactive manner, with a 0.69 standardized path coefficient that supports H_4 (Hypothesis substantiated);

(5)   Under the existing Logistics Capability paradigm, Cloud Technology Investment affects Organizational Performance of Taiwan-listed photovoltaic companies in a significantly positive interactive manner, with a 0.67 standardized path coefficient that supports H5 (Hypothesis substantiated).

Conclusion and suggestions

Conclusions
Regarding the verification of SEM, this study has a good model fit as the constructed a SEM with satisfactory goodness-of-fit in the Measurement, Structural and the Overall Models. These concrete results are as shown below.

(1)   Flexible Manufacturing Capability has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies;
(2)   Logistics Capability has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies;
(3)   Cloud Technology Investment has a significantly positive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies;
(4)   Cloud Technology Investment, under the existing Flexible Manufacturing   Capability paradigm, has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies; and
(5)   Cloud Technology Investment, under the existing Logistics Capability paradigm, has a significantly interactive effect upon the Organizational Performance of Taiwan-listed photovoltaic companies.

The above (4) and (5) have the significant meanings if the "Interactive Effect" happens.

Contributions of the present study
This study has important practical implications as it performed modeling in accordance with the summarized literature review, and then verified the model for goodness-of-fit effects. The present study, consequently, is a CFA-based one addressing topics that are both innovative and important in terms of business practices, with the results not only worthy of being the reference for subsequent researchers conducting further research on relevant fields, they can also serve as a reference for sustainable development for business decision-makers of Taiwan-listed Photovoltaic Companies.

Limitations and Suggestions
(1) This study adopts Simple Random Sampling method, which generated a low valid-sample return rate that may contribute to the phenomenon of insufficient representation of the population; and (2) this study is also focused solely on the CFA of Taiwan-listed photovoltaic companies, and future researchers are advised to conduct similar studies on SMEs companies or different industries to compare and see if, under the same model, there is any difference in goodness-of-fit among various industries.

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