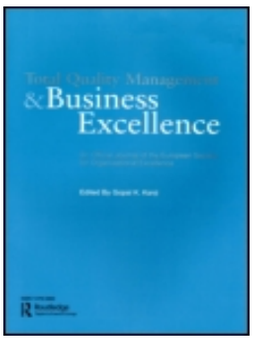

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The effects of total quality management and organisational learning on business performance: evidence from Taiwanese insurance industries

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This research is focused on the Taiwanese insurance industry to explore the relationship among total quality management (TQM), organisational learning (OL) and business performance of insurance companies. In this study, the questionnaires are analysed and the *t*-test, analysis of variance, and multiple regression models are used to verify the research framework and hypotheses. The results show significant difference of gender, position, educational level and industry on TQM, OL and business performance recognition, but there is no significant difference in seniority. Using multiple regression analysis and the mediating test, the principal findings of this study are shown as follows: (1) TQM has significant and positive effects on OL, (2) Both TQM and OL have significant and positive effects on business performance, (3) OL fosters business performance and plays a mediating role between TQM and business performance, and (4) The non-life and the life insurance industries, which carry out TQM, OL and business performance, are significantly different. The results show practical implications for the insurance industry in Taiwan.

Keywords: insurance industry; total quality management; organisational learning; business performance; mediating effects

Introduction

According to Taiwan Insurance Institute reports, the assets of the insurance industry accounted for 26.3% of the total assets owned by Taiwanese financial institutions in 2010, indicating the rising importance of insurance in the financial industry and its decisive position in the development of the financial service industry as a whole. The insurance company provides intangible commodities and sells 'risk protection' as well as 'service value'. Therefore, it can be accepted that the blue ocean strategy for insurance business, by providing customers with additional added values and quality services, has become a crucial topic in the insurance industry. Juran (1993) argued that competitive advantages could be obtained by the quality or service of products, and quality control has gradually become the critical competitive factor in the global market. As a result, total quality management (TQM) has been widely accepted as the effective management tool to provide stable business operation, growth and success for enterprises (Issac, Rajendran, & Anantharaman, 2004).

Taiwan's insurance market is highly competitive, as each insurance company fights to stand out in the competition. Hence, the improvement of company commodity value, the

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enhancement of service quality, and the control of operational costs to strengthen competitive advantages (Hsueh, 2012; Siddiqui & Sharma, 2010) have become the critical success factors for the business operations of insurance companies. Numerous past literatures have confirmed that TQM increased customer satisfaction (Lee, Lam, Ooi, & Safa, 2010) and improved organisational performance (Irani, Beskese, & Love, 2004), such as firm's quality performance, leading to an improved financial and market performance (Kaynak, 2003). Most scholars agree that TQM positively affects business performance (Fotopoulos & Psomas, 2010; Lam, Lee, Ooi, & Lin, 2011).

As information technology advances and industrial competition is no longer resource-based, the accumulation and use of knowledge within the organisation are the most important intellectual assets to create value (Senge, 1990). Such change can further affect the concepts and the behaviour patterns of organisational members, enabling the organisation with innovative growth and the ability to adapt to change. The insurance industry is a knowledge-intensive service sector. Therefore, for insurance companies, the most important core capability is service quality control and the strengthening of professional knowledge, which rely heavily on organisational learning (OL) to enable enterprises to remain competitive in a rapidly changing environment.

The concept of TQM has been introduced from manufacturing industries into the financial service industries (Pattanayak & Maddulety, 2011; Selvaraj, 2009). Nevertheless, studies on how the insurance industry effectively promotes TQM to enhance competitiveness are few. For example, Weng (2012) studied that a Taiwan life insurance company, implementing TQM activities and process reengineering, resulted in the improvement of performance about business workflow related to cycle time, customer oriented process, support process, management process, and productivity. Hence, the main purpose of this study is to explore the relationship among TQM, OL and business performance of insurance companies in Taiwan.

This paper extends the prior research and contributes to the existing body of literature. First, our empirical results are strongly supported and can be served as the reference for future studies on the integration of TQM, OL and business performance. Secondly, this study uses OL as the mediating effect to discuss the impact of OL on the relationship between TQM and business performance. Third, this study is one of the first to investigate this issue in the insurance industry and explore the difference in a variety of perspectives about the promotion TQM, OL and business performance in the non-life and life insurance industry in order to provide a recommendation to strengthen the competitive advantage, and the results can be applied to other financial industries.

The remainder of this paper is organised as follows. The next section discusses the literatures related to TQM, OL and business performance. The subsequent section illustrates the research framework and methodologies. In the penultimate section, the empirical results are discussed. Finally, the paper offers conclusions and managerial implications.

Literature review and hypotheses

Relationship between TQM, OL and business performance

The employees of different backgrounds for TQM, OL and business performance as the respondents may be varied according to the different factors. Thus, we can suggest the following hypothesis:

H1: For insurance company, demographic variables and corporate variables on TQM, OL and business performance have significant difference in cognition.

Relationship between TQM and OL

Love, Li, Irani, and Faniran (2000) pointed out that the implementation of TQM must rely on continuous improvements of the organisation, but is also related to OL, which were the bases of achieving TQM. Hung, Lien, Yang, Wu, and Kuo (2011) have also shown that TQM significantly and positively affected OL in the Taiwanese high tech industry. Furthermore, TQM could play the role of facilitator of the OL environment (Lee, Ooi, Sohal, & Chong, 2012). Therefore, we can suggest the following hypothesis:

H2: For insurance company, the implementation of TQM has a positive impact on OL.

Relationship between OL and business performance

OL is valuable to firm's customers because it focuses on understanding and effectively satisfying their expressed and latent needs through new products, services and ways of doing business. This should directly lead to superior outcomes, such as greater success of new products, superior customer retention, higher customer-oriented quality, and ultimately superior growth and/or profitability (Bontis, Crossan, & Hulland, 2002; Hurley & Hult, 1998). Ellinger, Ellinger, Yang, and Howton (2002) showed the results of an empirical study with a positive relationship between the OL concept and firms' financial performance. In addition, some other arguments about the positive influence of OL on firm performance were stated by Martinez-Costa and Jimenez (2009). Thus, we can suggest the following hypothesis:

H3: For insurance company, OL has a positive impact on business performance.

Relationship between TQM and business performance

The firms with effective TQM implementation could accomplish the internal benefits such as improving quality, enhancing productivity, or realising better operating income (Prajogo & Brown, 2012; Tanninen, Puumalainen, & Sandström, 2010). Numerous empirical studies, which attempted to examine the impact of TQM, supported the proposition that a continuous commitment to TQM implementation had a significant positive effect on superior firm performance, as evidenced in the case of service firms (Agus, 2004), small and medium enterprises (Wali & Boujelbene, 2010) and European companies (Boulter, Bendell, & Dahlgaard, 2013). TQM factors could significantly affect the firm's performance with respect to internal procedures, customers, market share, and the natural and social environment (Zakuan, Takala, Ahmad, & Jusoh, 2013). Based on the preceding discussion, we propose the hypothesis:

H4: For insurance company, TQM implementation has a positive impact on business performance.

TQM and business performance: the mediating roles of OL

TQM success requires an organisational culture based on the trust and knowledge sharing (Conner & Prahalad, 1996). Through better knowledge and understanding, OL facilitates behaviour change that leads to improved performance (Garvin, 1993). Hung et al. (2011) showed that TQM has a significant and positive effect on innovation performance and OL partially mediates such an effect. Thus, OL aims to create mutual trust and the knowledge-sharing culture among organisational members, and thus OL becomes an important

mediating role for TQM on improving performance (Lam et al., 2011). Based on the preceding discussion, we propose the hypothesis:

H5: TQM through the mediating effect of OL has a significantly positive impact on business performance.

Research framework and methodologies

Research framework

Based on the literature review, a research model is developed in order to investigate the relationship among the promotion of TQM, OL and business performance in the insurance industry. The concept of the proposed research framework is illustrated in Figure 1.

Questionnaire design and measures of constructs

The questionnaires are designed with single choice items, and can be divided into four parts. The first part contains 19 items on the subject's views about the implementation of TQM activities. This study is based on the characteristics of the insurance industries, and through a comprehensive review of the TQM literature, including four constructs of TQM practice, named customer focus (Dale, 1999; Tsang & Antony, 2001), continuous improvement (Koçoğlu, İmamoğlu, & İnce, 2011; Tsang & Antony, 2001), process management (Flynn, Schroeder, & Sakakibara, 1995; Wang, Chen, & Chen, 2012) and service culture (Hoang, Igel, & Laosirihongthong, 2010; Selvaraj, 2009; Sureshchandar, Rajendran, & Anantharaman, 2001) selected to represent the core of TQM practices in

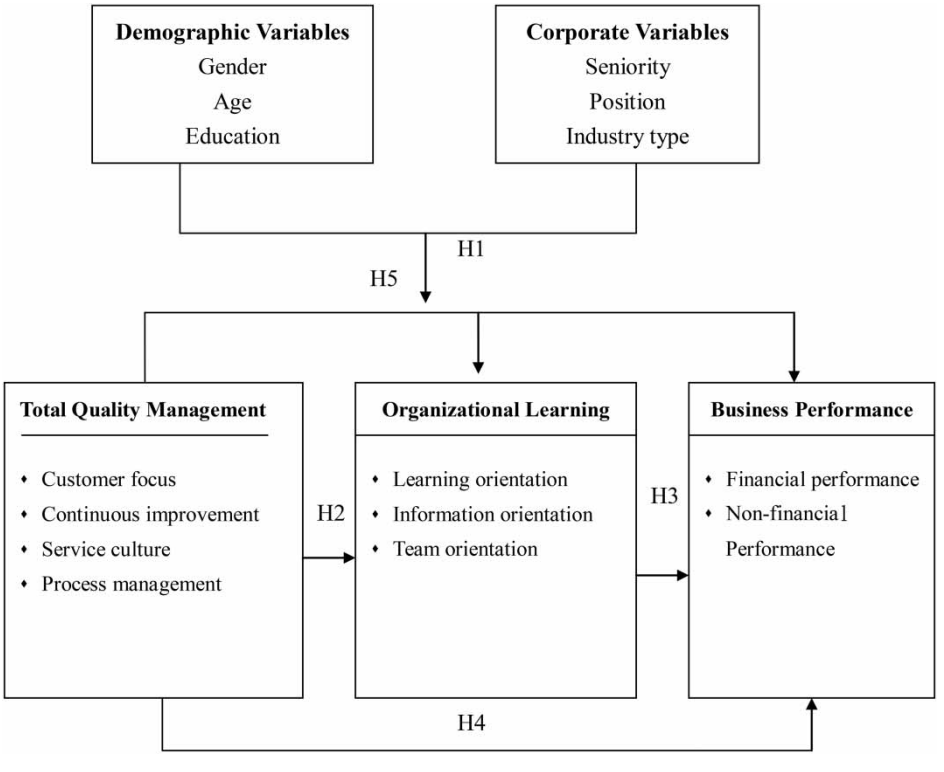

Figure 1. The research framework.

Table 1. The dimensions definition of TQM, OL.

Dimensions of TQM	Operational definition	Sources
Customer focus	The overriding purpose of all organisations is to satisfy their internal and external customer's need	Dale (1999), Oakland (2005)
Continuous improvement	The change management and creative thinking in the organisation structure of the work are encouraged to creatively exceed the quality standards or usual expectations	Koçoğlu et al. (2011)
Process management	The process variation can be reduced by building quality into operational process	Flynn et al. (1995)
Service culture	An organisational strategy can motivate the employees to have a service orientation in whatever they do	Sureshchandar et al. (2001)
Dimensions of OL		
Learning orientation	Organisation-wide activity of creating and using knowledge can enhance competitive advantage	Calantone, Cavusgi, and Zhao (2002)
Information orientation	The organisations actively seek out and gather useable information and share the information between functional units, through formal and informal channels (inducing information acquisition and information dissemination)	Slater and Narver (1995), Tippins and Sohi (2003)
Team orientation	Organisational members focused on sharing assumptions, thinking together to solve the problem, and charting the future operations of organisation	Senge (1990)

this study because these practices are found to be useful and relevant to the service industries (Brah, Wong, & Rao, 2000; Tsang & Antony, 2001). The second part contains 15 items on the subject's cognition of the implementation of OL by the company. OL according to the characteristics of the insurance industries could be divided into three aspects including learning orientation (Hult & Ferrel, 1997), information orientation (Tippins & Sohi, 2003) and team orientation (Hult, Ferrell, & Hurley, 2002). The third part contains 10 items on the impact of the implementation of TQM and OL on the company's business performance, which according to Venkatraman and Ramanujam (1986) divide into two aspects including financial performance (total premium revenues, profit after tax, and cost improvement) and non-financial performance (market share, customer satisfaction, and employee productivity). The fourth part contains six items on the basic personal information on the subject including the gender, age, educational level, seniority, position and industry type. Questionnaires are designed using a five-point Likert scale to facilitate measurement. Scores of 5, 4, 3, 2 and 1 are used to represent the answers to mean 'strongly agree', 'agree', 'no comment', 'disagree', 'strongly disagree', respectively. The dimensions definition of TQM, OL can be shown as Table 1.

Sample and data collection

This study targets the insurance industry in Taiwan. Judgment sampling is used to determine the sampling objects from the Taiwan Insurance Institute (2010). The data of this

Table 2. List of sample of insurers.

No.	Life insurers	Non-life insurers
1	Cathay Life Insurance Co. Ltd.	Fubon Insurance Co. Ltd.
2	Fubon Life Insurance Co. Ltd.	Cathay Century Insurance Co. Ltd.
3	Nan Shan Life Insurance Co. Ltd.	ShinKong Insurance Co. Ltd.
4	Shin Kong Life Insurance Co. Ltd.	Ming Tai Insurance Co. Ltd.
5	Chunghwa Post Life Insurance Co. Ltd.	Tokio Marine Newa Insurance Co. Ltd.
6	China Life Insurance Co. Ltd.	Union Insurance Co. Ltd.
7	Mercuries Life Insurance Co. Ltd.	Taian Insurance Co. Ltd.
8	Allianz Life Insurance Co. Ltd.	Chung Kuo Insurance Co. Ltd.
9		South China Insurance Co. Ltd.

research are from the survey of 17 insurance companies including life and non-life insurance. Subjects are the employees in insurance companies, including both staffs and managers, with more than one year of experience. A total of 17 insurance companies are selected, including 8 life insurance companies and 9 non-life insurance companies. These eight companies account for 83.70% of all life insurance employment, and nine companies account for 75.95% of all non-life insurance employment. Hence, the overall sample is representative, and can relatively reflect the actual situation of the insurance companies. A pilot study is conducted with a small size of 30 to clarify the overall structure of the questionnaire. The respondents provide the comments on the clarity of some items and confirm the validity of items in the questionnaire. Following the pilot test, the main survey is administered. Nine hundred and fifty questionnaires are distributed in the main survey and 850 valid samples were collected after eliminating 100 invalid samples; the valid questionnaires account for an effective response rate of 89.47%. Lists of sample of insurers are shown in Table 2.

Empirical results

Description of sample

A description of the sample is shown in Table 3. It is conspicuous that women account for 60.71% of the total sample. The highest educational attainment is primarily university graduate (43.29%). The seniority of the surveyed employees between 1 and 5 years accounts for 46.47%.

Reliability and validity analysis

This study can apply Cronbach's α to verify the consistency of items. According to Nunnally's point of view (1978), a score more than 0.7 is considered reliable. Since the Cronbach's α of this study's TQM, OL and business performance dimensions are all more than 0.7, these are consistently reliable. Regarding the validity, the contents of this study's questionnaire are based on the relevant theories, referred to related literatures' questionnaire contents and include the opinions of scholars. Thus, this study has a considerable degree of content validity. To test the construct validity of the questionnaire, factor analysis is performed on each construct. The Kaiser–Mayer–Olkin (KMO) measure of sampling adequacy test (Kaiser, 1974) and Bartlett's (1950) Sphericity test are carried out to evaluate the adequacy of each item. Hair, Anderson, Tatham, and Black (1998) suggested that, when the KMO value was greater than 0.6 and the *P*-value of the Bartlett's

Table 3. Description of sample.

Item	Category	Sample	Per cent
Gender	Male	334	39.29
	Female	516	60.71
Age	Less than 25 years	107	12.59
	25–35 years	335	39.41
	36–45 years	239	28.12
	46–55 years	145	17.06
	Over 56 years	24	2.82
Education	Senior high school	179	21.06
	College	234	27.53
	University	368	43.29
	Graduate school	69	8.12
Seniority	1–5	395	46.47
	6–15	332	39.06
	16 or more	123	14.47
Position	Management	204	24.00
	General staff	646	76.00
Industry type	Life insurance	436	51.29
	Non-life insurance	414	48.71

Sphericity test was closer to 0, the item was adequate for factor analysis. The results show that all the items have a measure above 0.9, indicating that the partial correlation among items is low and a high degree of collinearity is absent. Baerlett's test also shows that all the measures reach the level of significance ($p < 0.000$), indicating that a common factor is present. Therefore, the designed scale is appropriate for factor analysis.

The method of principle component and Varimax is used to extract and construct four variables of TQM, three variables of OL and two variables of business performance. In addition, according to Chang (2008), whether the questionnaire had validity could be judged by the factor loading of the factor analysis. In order to obtain both good reliability and validity, the questions with factor loading less than 0.5 were deleted through exploratory factor analysis. Hence, this study can modify the original questionnaire and review the validity of the modified questionnaire. According to the above standard, in TQM dimension, five items should be removed. The modified TQM dimension contains 14 items, and no item is removed from the other two dimensions. The operational definitions for each construct satisfy the requirement of construct validity.

Variation analysis of demographic variables and corporate variables

This study first tests *H1* to analyse the influence of demographic variables and corporate variables on the cognition of TQM, OL and business performance. Since there are only two groups in items of gender, position and industry type, the *t*-test is performed. The results show that gender, position and industry type have significantly different effects on cognition of TQM, OL and business performance.

Since age, seniority and education level are the variables with more than three groups, this study uses the analysis of variance (ANOVA) to test whether they have significantly different effects on the awareness of TQM, OL and business performance. The results show that seniority has no significant differences in terms of the cognition of TQM, OL and business performance, indicating that insurance company employees have consistent

Table 4. Demographic variables and corporate variables of the *t*-test and ANOVA analysis.

	TQM		OL		BP	
	t-Value	*p*-Value	*t*-Value	*p*-Value	*t*-Value	*p*-Value
Gender	−3.517***	0.000	−4.725***	0.000	−3.632***	0.000
Position	1.970*	0.049	1.992*	0.047	3.807***	0.000
Industry type	6.504***	0.000	10.445***	0.000	6.619**	0.000
Age	2.362	0.052	3.517***	0.007	1.892	0.095
Education	6.292***	0.000	15.858***	0.000	6.993***	0.000
Seniority	0.661	0.517	1.335	0.264	0.632	0.532

Notes: TQM, total quality management; OL, organisational learning; BP, business performance.
*Significant at $P < 0.05$.
**Significant at $P < 0.01$.
***Significant at $P < 0.001$.

common cognition of the three dimensions regardless of seniority. However, educational level has significant differences in terms of the impact on the cognition of the three dimensions. The results of the *t*-test and ANOVA of the demographic variables and corporate variables are summarised in Table 4.

Relationships in between TQM, OL and business performance

Relationships between TQM and OL in the non-life insurance industry

This study uses the multiple regression models to test the relationship between TQM and OL to verify *H2*. As a higher variance inflation factor (VIF) value represents a more significant co-linearity of independent variables, a VIF value above 10 means serious problem of co-linearity (Gujarati, 1995). First, in the co-linearity analysis, VIF values of independent variables are all smaller than 3, indicating that there is no problem of co-linearity in between independent variables. The result is summarised in Table 5.

The regression equation has a significance level ($F = 183.231$, $P = 0.000$), and the model predictability (Adj R^2) value is 0.638, indicating that it has a greater prediction ability. The aspect of continuous improvement ($t = 5.273$, $p = 0.000$), service culture ($t = 9.349$, $p = 0.000$) and process management ($t = 3.838$, $p = 0.000$) have all

Table 5. Non-life insurance TQM and OL regression analysis.

Dependent variables: OL				
Independent variables	Standardised coefficient	*t*-Value	Significant	VIF
Customer focus	0.001	0.023	0.982	1.812
Continuous improvement	0.266	5.273	0.000***	2.913
Service culture	0.453	9.349	0.000***	2.680
Process management	0.170	3.838	0.000***	2.233
F-value	183.231			
P-value	0.000***			
Adj R^2	0.638			

*Significant at $P < 0.05$.
**Significant at $P < 0.01$.
***Significant at $P < 0.001$.

significant impact, indicating that the three aspects in the TQM dimension, namely continuous improvement, service culture, and process management have positive and significant effects on OL, while customer focus ($t = 0.023$, $p = 0.982$) has no significant impact on OL. The standardised coefficient β values suggest that service culture of $\beta = 0.453$, continuous improvement of $\beta = 0.266$, and process management of $\beta = 0.170$, indicating that the effect of service culture on OL is greater than continuous improvement, followed by process management.

Relationships between OL and business performance in the non-life insurance industry

This study uses the multiple regression models to test the relationship between OL and business performance to verify *H3*. First, in the co-linearity analysis, the VIF values of independent variables are all lower than 4.5, indicating there is no problem of co-linearity between independent variables. The result is shown in Table 6.

The regression equation has a significance level ($F = 91.993$, $P = 0.000$), and the model predictability (Adj R^2) value is 0.398. The aspect of information orientation ($t = 2.624$, $p = 0.009$) and team orientation ($t = 5.096$, $p = 0.000$), indicating that information orientation and team orientation have a positive and significant impact on business performance, while learning orientation ($t = 1.226$, $p = 0.221$) has no significant impact on business performance. The standardised coefficient β values show team orientation of $\beta = 0.389$ and information orientation of $\beta = 0.204$, indicating that the effect of team orientation on business performance is greater than information orientation.

Relationships between TQM and business performance in the non-life insurance industry

This study uses the multiple regression models to test the relationship between TQM and business performance to verify *H4*. First, in the co-linearity analysis, the VIF values of independent variables are all smaller than 3, indicating that there is no problem of co-linearity in between independent variables. The result is summarised in Table 7.

The regression equation has a significance level ($F = 103.128$, $P = 0.000$), and the model predictability (Adj R^2) value is 0.497. The aspect of customer focus ($t = 4.148$, $p = 0.000$) and process management ($t = 8.773$, $p = 0.000$) indicate that customer focus and process management have a positive and significant impact on business performance, while continuous improvement and service culture have no significant impact on business performance. The standardised coefficient β values show process management

Table 6. Non-life insurance OL and business performance regression analysis.

Dependent variables: business performance				
Independent variables	Standardised coefficient	*t*-Value	Significant	VIF
Learning orientation	0.076	1.226	0.221	2.621
Information orientation	0.204	2.624	0.009**	4.157
Team orientation	0.389	5.096	0.000***	4.002
F-value	91.993			
P-value	0.000***			
Adj R^2	0.398			

*Significant at $P < 0.05$.
**Significant at $P < 0.01$.
***Significant at $P < 0.001$.

Table 7. Non-life insurance TQM and business performance regression analysis.

Dependent variables: business performance				
Independent variables	Standardised coefficient	*t*-Value	Significant	VIF
Customer focus	0.195	4.148	0.000***	1.812
Continuous improvement	0.064	1.070	0.285	2.913
Service culture	0.094	1.648	0.100	2.680
Process management	0.457	8.773	0.000***	2.233
F-value	103.128			
P-value	0.000***			
Adj R^2	0.497			

*Significant at $P < 0.05$.
**Significant at $P < 0.01$.
***Significant at $P < 0.001$.

of $\beta = 0.457$ and customer focus of $\beta = 0.195$, indicating that the effect of process management on business performance is greater than customer focus.

Relationships between TQM and OL in the life insurance industry

This study used the multiple regression models to test the relationship between TQM and OL to verify *H2*. First, in the co-linearity analysis, the VIF values of various independent variables are all below 3, indicating that there is no problem of co-linearity between independent variables. The result is shown in Table 8.

The regression equation has a significance level ($F = 197.746$, $P = 0.000$), and the model predictability (Adj R^2) value is 0.644, indicating that it has a greater prediction ability. The aspect of continuous improvement ($t = 7.929$, $p = 0.000$), service culture ($t = 7.101$, $p = 0.000$) and process management ($t = 5.510$, $p = 0.000$) have all significant impact, indicating that the three aspects in the TQM dimension, namely continuous improvement, service culture, and process management have positive and significant effects on OL, while customer focus ($t = 0.733$, $p = 0.464$) has no significant impact on OL. The standardised coefficient β values suggest continuous improvement of $\beta = 0.338$, service culture of $\beta = 0.320$, and process management of $\beta = 0.231$, indicating

Table 8. Life insurance TQM and OL regression analysis.

Dependent variables: OL				
Independent variables	Standardised coefficient	*t*-Value	Significant	VIF
Customer focus	0.026	0.733	0.464	1.494
Continuous improvement	0.338	7.929	0.000***	2.219
Service culture	0.320	7.101	0.000***	2.486
Process management	0.231	5.510	0.000***	2.156
F-value	197.746			
P-value	0.000***			
Adj R^2	0.644			

*Significant at $P < 0.05$.
**Significant at $P < 0.01$.
***Significant at $P < 0.001$.

that the effect of continuous improvement on OL is greater than service culture, followed by process management.

Relationships between OL and business performance in the life insurance industry

This study uses the multiple regression models to test the relationship between OL and business performance to verify *H3*. First, in the co-linearity analysis, the VIF values of various independent variables are all lower than 3, indicating there is no problem of co-linearity between independent variables. The result is shown in Table 9.

The regression equation has a significance level ($F = 172.210$, $P = 0.000$), and the model predictability (Adj R^2) value is 0.541. The items of learning orientation ($t = 3.146$, $p = 0.002$), team orientation ($t = 8.000$, $p = 0.000$) and information orientation ($t = 5.997$, $p = 0.000$) indicate that these three aspects in the OL dimension, namely learning orientation, team orientation and information orientation, have positive and significant effects on business performance. The standardised coefficient β values show team orientation of $\beta = 0.394$, information orientation of $\beta = 0.292$, and learning orientation of $\beta = 0.139$, indicating that the effect of team orientation on business performance is greater than information orientation and learning orientation.

Relationships between TQM and business performance in the life insurance industry

This study used the multiple regression models to test the relationship between TQM and business performance to verify *H4*. First, in the co-linearity analysis, the VIF values of various independent variables are all smaller than 3, indicating that there is no problem of co-linearity between independent variables. The result is shown in Table 10.

The regression equation has a significance level ($F = 96.127$, $P = 0.000$), and the model predictability (Adj R^2) value is 0.467. The aspects of continuous improvement ($t = 6.783$, $p = 0.000$), process management ($t = 4.951$, $p = 0.000$) and service culture ($t = 2.315$, $p = 0.021$) indicate that continuous improvement, process management and service culture have a positive and significant impact on business performance, while customer focus has no significant impact on business performance. The standardised coefficient β values show continuous improvement of $\beta = 0.354$, process management of $\beta = 0.255$, service culture of $\beta = 0.128$, indicating that the effect of continuous improvement on business performance is greater than process management and service culture.

Table 9. Life insurance OL and business performance regression analysis.

Dependent variables: business performance				
Independent variables	Standardised coefficient	*t*-Value	Significant	VIF
Learning orientation	0.139	3.146	0.002**	1.864
Information orientation	0.394	8.000	0.000***	2.303
Team orientation	0.292	5.997	0.000***	2.251
F-value	172.210			
P-value	0.000***			
Adj R^2	0.541			

*Significant at $P < 0.05$.
**Significant at $P < 0.01$.
***Significant at $P < 0.001$.

Table 10. Life insurance TQM and business performance regression analysis.

Dependent variables: business performance				
Independent variables	Standardised coefficient	*t*-Value	Significant	VIF
Customer focus	0.052	1.223	0.222	1.494
Continuous improvement	0.354	6.783	0.000***	2.219
Service culture	0.128	2.315	0.021*	2.486
Process management	0.255	4.951	0.000***	2.156
F-value	96.127			
P-value	0.000***			
Adj R^2	0.467			

*Significant at $P < 0.05$.
**Significant at $P < 0.01$.
***Significant at $P < 0.001$.

OL mediating effects test

This study uses the multiple regression model to verify the assumed mediation effects of OL of *H5*. According to the mediation effects verification method proposed by Baron and Kenny (1986), this study tests the existence of the OL mediation effects in the case of the insurance industries, and categorises the mediation effects into to partial mediation effects and completed mediation effects by the following: step (1) test the existence of relationship between independent variables and dependent variables; step (2) test the relationships between independent variables, mediation variables and dependent variables, and in case of declining and significant decrease in path coefficient as compared with step 1, it is the partial mediation; if the testing results of independent variables, mediation variables and dependent variables are not of a significant level, it is called the completed mediation.

Test of OL mediation effects in the non-life insurance industry

The relationship between TQM and business performance in the non-life insurance industry has a significant level ($\beta = 0.675$, $p < 0.001$). However, when the mediation variable OL is added into the TQM and business performance model, 'TQM and OL' and 'OL and business performance' have significance levels ($\beta = 0.766$, $p < 0.001$; $\beta = 0.264$, $p < 0.001$), satisfying the step 1 conditions. However, although 'TQM and business performance' has a significant level ($\beta = 0.473$, $p < 0.001$), its path coefficient is reduced from 0.675 to 0.473, satisfying the step 2 condition, indicating that OL has partial mediation effects on TQM and business performance, as shown in Figure 2.

Test of OL mediation effects in the life insurance industry

The relationship between TQM and business performance in the life insurance industry has a significant level ($\beta = 0.670$, $p < 0.001$). However, when the mediation variable OL is added into the TQM and business performance model, 'TQM and OL' and 'OL and business performance' have significance levels ($\beta = 0.785$, $p < 0.001$; $\beta = 0.528$, $p < 0.001$), satisfying the step 1 conditions. However, although 'TQM and business performance' has a significant level ($\beta = 0.256$, $p < 0.001$), its path coefficient is reduced from 0.670 to 0.256, satisfying the step 2 condition, indicating that OL has partial mediation effects on TQM and business performance, as shown in Figure 3.

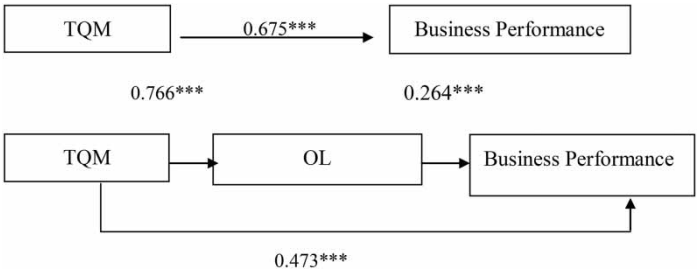

Figure 2. Test of OL mediation effects in the non-life insurance industry. *Significant at $P < 0.05$, **Significant at $P < 0.01$, ***Significant at $P < 0.001$.

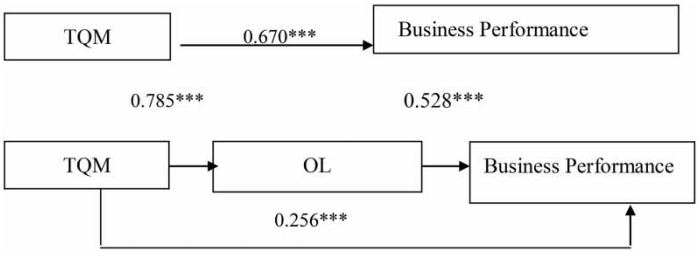

Figure 3. Test of OL mediation effects in the life insurance industry. *Significant at $P < 0.05$, **Significant at $P < 0.01$, ***Significant at $P < 0.001$.

In sum, OL in the insurance industry has partial mediation effects on TQM and business performance. Hence, the *H5* of this study, that OL is the mediation variable of TQM and business performance, can be confirmed.

Conclusions and managerial implications

Research conclusions

This study proposes the relationship among the implementation TQM, OL and business performance through empirical analysis. The results are as summarised and illustrated as follows:

(1) The empirical results of this study suggest that TQM has a significant and positive impact on OL, as proposed Hung et al. (2011). OL is the result of TQM implementation. Although the research suggests that the customer focus aspect of TQM dimension has no significant impact on OL in the insurance industry, the insurance companies can have more complete OL capabilities by committing to the improvement of quality management in customer focus to gain better knowledge accumulation and innovation capabilities to strengthen overall competitive advantages.
(2) This study presents that OL has a significant and positive impact on business performance. The results are consistent with the findings from Martinez-Costa and Jimenez (2009). This suggests that the insurance companies can be committed to the promotion and innovation of OL activities. Meanwhile, it also means that insurance companies can improve business performance as long as a learning culture is applied in products, sales and process innovation.

(3) The empirical results indicate that TQM has a significant and positive impact on the business performance. The results are consistent with the findings by Agus (2004). Hence, it is suggested that insurance companies promote such activities to strengthen company service quality in order to improve customer relations to enhance customer satisfaction and business performance.
(4) This study shows that TQM can affect business performance of the company through the mediating effects of OL. The results are consistent with the findings by Hung et al. (2011). Hence, insurance companies are advised to consider the creation of an OL environment and team learning. In this way, by combining OL and TQM promotion, business performance can be improved.

Managerial implications

From a managerial point of view, this paper has several implications for the insurance industry. First, the insurance industries should concentrate on the customer focus aspect of TQM, while the non-life insurance industry should strengthen the learning orientation aspect of OL. Second, insurance industries should continuously provide training and educational opportunities for employees to create a learning environment. Third, insurance companies are advised to use four-step procedure to change a company's culture including plan, do, study, and action (Dahlgaard, Chen, Jang, Banegas, & Dahlgaard-Park, 2013) and improve customer's relationships to enhance customer satisfaction and business performance. Finally, insurance executives have to establish a perfect communication system inside the company and continuously assess the customer satisfaction of existing and potential customers and enhance total quality service for effective improvement in overall business performance (Boulter et al., 2013).

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