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Decision Facilitating Role of Comprehensive Performance Measurement System (CPMS) and Job Performance: Influence of Role Ambiguity and Locus of Control

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ABSTRACT

This research examines the decision facilitating role of CPMS on manager's role ambiguity and also influence of personality traits of locus of control between CPMS and job performance. Incorporating role theory and social learning theory, this research hypothesises that informational characteristic of CPMS is useful to reduce manager's role ambiguity and in turn enhance their job performance. Data were collected from 120 business unit managers of manufacturing firms listed in the Federation of Malaysian Manufacturers (FMM) 2011 Directory. The results provide evidence that CPMS reduces manager's role ambiguity, which in turn enhances job performance. Additionally, the results also indicate that locus of control moderates only the relation between CPMS and role ambiguity and that there is no evidence of moderation identified between CPMS and job performance.

Keywords: Performance Measurement System, locus of control, role ambiguity, job performance

INTRODUCTION

Research has previously examined behavioural consequences of management accounting system (MAS), particularly in the context of contemporary PMS and traditional PMS. Contemporary PMS refers to PMS such as Balanced Scorecard (BSC), Strategic Performance Measurement System (SPMS), Comprehensive PMS (CPMS) and/or other terms of PMS that are interchangeably used in prior research. BSC is defined as a set of measures that

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provide top managers comprehensive views of the business performance (Kaplan & Norton, 1996; Malina & Selto, 2001). SPMS permits an organisation to communicate comprehensive information regarding its long-term strategy, the relations among various organisational strategic objectives and the link between strategic goals and employees' actions (Burney & Matherly, 2007). BSC is mainly used as a decision facilitating role and decision influencing role in an organisation. Sprinkle (2003) claimed that performance measure for decision-facilitating refers to the use of performance measure to provide information and guide managers in decision-making, whereas performance measure is used for decision-influencing role in the performance evaluation functions.

Prior research identified several factors influencing the relation between PMS and individual outcome such as role ambiguity and job relevant information (Burney & Widenner, 2007), procedural fairness, organisational commitment (Lau & Moser, 2008), psychological empowerment and role clarity (Hall, 2008), trust and fairness (Lau & Sholihion, 2005) and justice perception (Burney, Henle, & Widener, 2009). Consistent with organisational theory, this line of research emphasises the important role of PMS as in influencing manager's behaviour, which in turn contributes to organisation's long-term success (De Haas & Kleingeld, 1999). The use of SPMS (BSC) can be problematic due to limitations in managers' cognitive abilities to process a lot of information that causes them to ignore certain information from PMS (Banker, Chang, & Pizzini, 2004). Thus, they may not be able to cope with complex and incompatible demands from multiple goals (Cheng, Luckett, & Mahama, 2007). In view of the limitations, the use of contemporary PMS may result in detrimental effects to reduce mission clarity and subordinate trust that may result in reduced motivation (Rinsum & Verbeeten, 2010). Thus, there is a need to further investigate other factors such as manager's cognitive abilities that may influence the relationship between PMS and performance.

Based on the accounting decision making theory, decision-maker and task characteristics, as well as the interactions between these characteristics may influence decision-making behaviour (Peters, 1993; Hogath, 1993). Prior research examining the moderating role of individual differences such as locus of control personality on the relation between MAS and individual performance found that locus of control affected how manager accept, perceive and respond to MAS information (Chong & Eggleton, 2003; Luckett & Eggleton, 1991). Thus, the objective of this research is to identify other factors specifically personal factors that may contribute to the effective use of PMS. In more specific, this study examines the influence of personality variable and locus of control in the relationship between PMS feedback on role ambiguity and job performance.

THEORETICAL FRAMEWORK AND FORMULATION OF HYPOTHESES

The theoretical framework of this study, as shown in Figure 1, is developed based on the role theory and social learning theory. The role theory describes that MAS information is useful to communicate role expectation. A more comprehensive PMS provides information that can reduce managers' role ambiguity, which can lead to enhanced job performance. The social learning theory describes the locus of control dimensions into internal and external (Rotter, 1960). Internals are individuals who believe that behaviour causality is caused by the individuals themselves, but externals are influenced by external factors. Internals have higher generalised expectancy such that own effort is crucial for attainment of goal, while externals have low generalised expectancy and believe that own effort is not fundamental for goal attainment. Thus, LOC personality may influence the use of PMS information by managers. Internals perceive CPMS information to be useful for them compared to the externals to reduce their role ambiguity and enhance their performance.

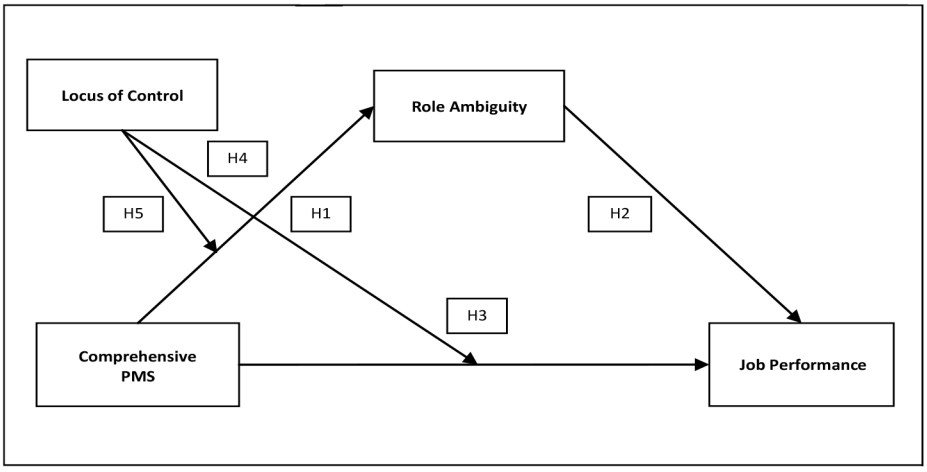

Fig.1: Conceptual framework presents the relationship between CPMS, role ambiguity and job performance

CPMS and Role Ambiguity

According to Atkinson, Waterhouse and Wells (1997), comprehensive PMS plays important role in coordinating, monitoring and diagnostic in an organisation. The monitoring role of PMS refers to the feedback provided by the system on assessment of progress in achieving organisational goal. Feedback from MAS (internal source) can provide comprehensive information that can clarify the role of managers (Ilgen, Fisher, & Taylor, 1979). Since PMS is part of MAS, the role theory may explain how individual behaviour could be influenced by role expectation suggesting feedback from

comprehensive PMS may help to provide clear and comprehensive information about role and job expectation which may reduce manager's uncertainty or role ambiguity (Birnberg, Luft, & Shield, 2006). Meanwhile, Burney and Widener (2007) found direct and indirect associations between SPMS and role ambiguity that provide evidence that the relationship between SPMS and role ambiguity is via enhancing job relevant information (JRI). Similarly, Hall (2008) also identified the mediating effect role clarity (goal clarity and process clarity) in the relation between CPMS and managerial performance. Thus, based on these empirical evidence, the research proposes that the cognitive role of comprehensive PMS is expected to reduce subordinates' levels of role ambiguity and consequently lead to enhanced job performance.

H1: There is a negative relation between CPMS and role ambiguity

Role Ambiguity and Job Performance

Role ambiguity is one of the major concepts of role theory (Schuler, Aldag, & Brief, 1977) and extensive studies focusing on the relationship between role ambiguity and ranges of their antecedents, consequences and correlates have been conducted (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). Earlier research identified inconsistent findings between these role constructs and individual performance (Schuler *et al*., 1977). A meta-analysis based on the results of 43 past studies clarified prior findings that role ambiguity is negatively and consistently related to job satisfactions (Fisher & Gitelson, 1983). Additionally, recent meta-review research also found a negative relationship between job performance and role ambiguity (Tubre & Collin, 2000). Studies examining the cognitive effect of participative budgeting on role ambiguity also found negative relationships between role ambiguity and job performance (Chong, Eggleton, & Leong, 2006). As there is strong theoretical and empirical evidence indicating the negative effect of role ambiguity on job performance, the following hypothesis is proposed:

H2: There is a negative relation between role ambiguity and job performance.

Comprehensive PMS and Job Performance

More comprehensive PMS provides managers with complete feedback about SBU operations and results (Malina & Selto, 2001). Managers who use BSC (2 characteristics: perspective framework and strategy link) establish strong connections with the strategy are better informed about actions desired. Additionally, inclusion of non-financial measures in BSC categories is positively related to job satisfaction (Burney & Swanson, 2010). Broad scope MAS information is associated with PEU, particularly integrated information is useful to those managers with independent operation (Tubre & Collin, 2000). Under high perceived environmental

uncertainty (PEU), the broad scope of MAS information (including financial, nonfinancial and future management accounting information) is effective for managerial decision and performance (Gul & Chia, 1984). An interactive model of work performance by Blumberg and Pringle (1982) suggests how work performance is being influenced by capacity, willingness and opportunity. A capacity to perform refers to the physiological and cognitive capabilities whereas opportunity consists of forces beyond individual's direct control surrounding task that enables individual to perform task effectively. Information is one of the variables in the opportunity that interacts with the capacity and willingness to ensure performance more probable. Thus, H3 proposes that managers perform better when information is available to them to perform their job.

H3: There is positive relation between CPMS and job performance

LOC Influence in the Relationship between CPMS and Job Performance

Prior budgeting literature suggests that individuals' differences affect how managers use information (Brownell, 1981; Chong & Eggleton, 2003). Brownell (1981) found significant positive effects of traditional PMS on managerial performance for internals although the effect was negative for externals. A review of research in psychology and accounting identified locus of control as one of the four (4) factors influencing behavioural consequences of feedback (Luckett & Eggleton, 1991). Internals would be more likely to initiate remedial actions rather than external under high environmental uncertainty. Similarly, psychological studies also found internals to be more insistent in searching for task relevant information (Organ & Green, 1974). Remedial action due to feedback is more likely to be initiated by internals (Feather, 1968). An assemblage of the broad scope of MAS information such as BSC has been identified to improve internal manager performance whist the information is insensitive to external managers (Chong & Eggleton, 2003) (pg. 168). Thus, this research proposes the following hypothesis:

H4: LOC moderates the relation between CPMS and job performance.

LOC Influence in the Relationship between CPMS and Role Ambiguity

Apart from organisational factors, personal characteristics may also have significant influence on individual role ambiguity. In particular, personal characteristics may contribute to the differences in the way individuals act in different situations. A meta-analytic review found positive correlations between LOC and role ambiguity providing evidence of high ambiguity associated with external LOC (Jackson & Schuler, 1985). Internals are also better informed about their occupations and tend to rely more upon self-generated role definitions to bring clarity and consistency in a particular situation than externals (Organ & Greene, 1974). Internals are also

claimed to have more ability to exercise control over their environment (Anderson, 1977). Research in a non-western culture like Taiwan indicates that LOC plays an important role in predicting levels of role ambiguity. Internals have lower job stress (ambiguity and conflict) as they have more positive views of work role, able to cope with stress (Chen & Silverthorne, 2008) and have a strong sense of personal control (Thomas, Kelly, & Lillian, 2006). Hence, the following hypothesis is proposed:

H5: LOC moderates the relation between CPMS and role ambiguity

RESEARCH METHODOLOGY

Sample

Data were collected using a questionnaire survey administered to the business unit managers within randomly selected Malaysian manufacturing companies listed in the Federation of Malaysian Manufacturer (FMM) directory of Malaysian Industries 2011. From September to December 2011, a total of 600 surveys were sent to 600 managers via email. Out of 134 responses, 14 were incomplete leaving 120 useable responses that yielded a final response rate of 20%. The independent t-test result indicates that the non-response bias does not appear to be problematic.

Data Analysis and Measurement of Variables

Data were analysed using Partial Least Square Analysis (PLS) through SmartPLS version 2.00 for hypotheses testing (Ringle, Wende, & Will, 2005) and Statistical Package for Social Science (SPSS). PMS comprehensiveness is measured using an instrument consisting of 9 items developed by Hall (2008). A Likert scale ranging from 1 (not at all) to 7 (to a great extent) is used to indicate the extent of each characteristic in the business unit PMS. Role ambiguity is measured using 6 items with a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) developed by Rizzo et al. (1970). The terms are reversed scored and negatively worded in an effort to reduce the effects of response bias (Dale & Fox, 2008). Chance scale developed by Levenson (1973) provides an expedient way to measure locus of control and is more factorially stable (Blau, 1984). Job performance is measured using eight items with a seven-point Likert scale ranging from one (of little importance) to seven (extremely important) developed by Govindarajan and Gupta (1985) and Nouri and Parker (1998). The performance is measured in relation to the superior expectations considering the subunit's strategic objectives relevant to the following eight performance dimensions: product quality, product quantity, product timeliness, new product development, personnel development, budget achievement, cost reduction programs, and political or public affairs.

RESULTS AND DISCUSSION

Descriptive Analysis

Table 1 presents a descriptive statistics for the main variables. The observed mean

for CPMS is higher, while role ambiguity is slightly below the theoretical mean. As expected, the low mean observed for the locus of control indicates high internality since internals are considered to be more suitable of holding managerial positions and have better ability to exercise control over their environment taking appropriate information-seeking and utilisation behaviour (Anderson, 1977).

TABLE 1
Descriptive Statistics of the Main Variables (n=120)

Variable	Mean	Median	Std Deviation	Actual Range		Theoretical Range	
				Min	Max	Min	Max
CPMS	5.12	5.11	0.91	1.78	7.00	1.00	7.00
ROLEAMB	2.74	2.83	0.86	1.00	5.67	1.00	7.00
JOBPERF	5.13	5.12	0.85	3.13	6.75	1.00	7.00
LOC	3.14	3.12	1.04	1.00	5.88	1.00	7.00

Validity and Reliability

The measurement model was assessed with regard to its reliability and validity of the multi-item scales. Factor loadings for each variable indicate that all items load on their respective constructs, except two items load below 0.5 (RA1 = 0.466 and JP8 = 0.416) being removed from the scale to avoid potential biasing (Hulland, 1999). Individual item reliability suggests satisfactory item reliability as all factor loadings are higher than 0.6 (Chin, 1998). All composite reliability indicators are above 0.7, indicating satisfactory construct reliability. Convergent validity appeared acceptable for all the reflective constructs. In Table 2, the average variance extracted (AVE) was at least 0.597, suggesting that on average, more variance was explained than unexplained in the variables associated with a given construct (Fornell & Larcker, 1981). Discriminant validity can be determined in two ways: (1) The Fornell-Larcker criterion and (2) the cross loadings.

TABLE 2
Properties of Measurement Model

	Indicators	Factor loadings	Composite reliability	Average variance extracted	Cronbach alpha
CPMS	CPMS1	0.822	0.945	0.658	0.934
	CPMS2	0.640			
	CPMS3	0.839			
	CPMS4	0.847			
	CPMS5	0.827			
	CPMS6	0.891			
	CPMS7	0.847			

TABLE 2 (continue)

	CPMS8	0.808			
	CPMS9	0.752			
Role Ambiguity	RA2	0.790	0.927	0.719	0.901
	RA3	0.797			
	RA4	0.840			
	RA5	0.915			
	RA6	0.890			
Job Performance	JP1	0.763	0.912	0.597	0.888
	JP2	0.799			
	JP3	0.767			
	JP4	0.638			
	JP5	0.834			
	JP6	0.816			
	JP7	0.777			

Table 3 shows that sufficient discriminant validity of constructs as all diagonal elements exceed the off-diagonal elements in the corresponding rows and columns. All indicators load higher on the intended measured construct than on any other constructs in Table 4 (Chin, 1998).

TABLE 3
Construct means, standard deviations and intercorrelations from the measurement model

Variable	Mean	SD	Correlations		
			CPMS	ROLEAMB	JOBPERF
CPMS	5.120	0.912	0.811		
ROLEAMB	2.743	0.856	-0.592	0.848	
JOBPERF	5.131	0.852	0.559	-0.591	0.773

TABLE 4
Cross-loading (full sample, n = 120)

	CPMS	JOBPERF	ROLEAMB
CPMS1	0.822	0.407	-0.494
CPMS2	0.640	0.502	-0.466
CPMS3	0.839	0.447	-0.471
CPMS4	0.847	0.507	-0.449
CPMS5	0.827	0.475	-0.412
CPMS6	0.891	0.497	-0.565
CPMS7	0.847	0.387	-0.475
CPMS8	0.808	0.474	-0.476
CPMS9	0.752	0.349	-0.489

TABLE 4 (continue)

JP1	0.297	0.763	-0.521
JP2	0.443	0.799	-0.568
JP3	0.382	0.767	-0.433
JP4	0.239	0.638	-0.222
JP5	0.544	0.834	-0.511
JP6	0.498	0.816	-0.391
JP7	0.523	0.777	-0.451
RA2	-0.459	-0.405	0.790
RA3	-0.432	-0.480	0.797
RA4	-0.503	-0.512	0.840
RA5	-0.568	-0.557	0.915
RA6	-0.535	-0.537	0.890

Test of Hypotheses

For the evaluation of the structural model and hypotheses testing, Partial Least Square (PLS) analysis and Moderated Regression Analysis (MRA) were used to test mediating and moderating effects, respectively. As shown in Table 5, the t values confirm the significance of hypotheses H1 (β = -0.592), H2 (β = -0.401) and H3 (β = 0.321). Role ambiguity has negative association with CPMS (t = 13.764, p<0.01) (H1) and also negative association with job performance (t = 9.047, p<0.01) (H2). Thus, H1 and H2 are supported. As for the path between CPMS and job performance, there is a positive association (t = 6.166, p<0.01) (H3).

TABLE 5
Path Coefficient and PLS Structural Model Results

Hypothesis	Path	Path coefficient	t value	Results
H1	CPMS -> ROLEAMB	-0.592	13.764***	Supported
H2	ROLEAMB -> JOBPERF	-0.401	9.047***	Supported
H3	CPMS -> JOBPERF	0.321	6.166**	Supported

* p<0.10, ** p<0.05, ***p<0.01 (one-tailed)

The variance explained (R^2) of the key endogenous construct is shown in Table 6; where job performance (0.417) and role ambiguity (0.351) indicate predictive power in the structural model.

According to Baron and Kenny (1986), there is mediation effect with the following conditions: (1) the independent variable significantly predicts mediator, (2) the mediator variable significantly predicts dependent variable, and (3) if the link between independent and dependent variable is also significant, it indicates partial mediation, but the insignificant

link suggests a full mediation. The results in Table 6 explain how the initial direct relation (CPMS and job performance) was altered by the subsequent introduction of the proposed mediator variables. Initially, path coefficient from CPMS and JP shows a direct positive and statistically significant effect on JP (β = 0.572, $p<0.01$, t = 17.858). When role ambiguity construct is introduced into the model, the relationships between CPMS and RA (β = -0.592, $p<0.01$, t = 13.764) and RA and JP (β = -0.401, $p<0.01$, t = 9.047) are significant. Meanwhile, although the path coefficient between CPMS and JP is still significant, it is at a lower significant value (β = 0.321, $p<0.01$, t = 6.166) suggesting the existence of partial mediation of role ambiguity between CPMS and job performance.

TABLE 6
Direct and indirect effects

Path	Direct relationship	Partial mediated relationship	R^2
n = 120			
Mediator		RA	
Effect on job performance			0.417
CPMS > JP			
RA > JP	0.572 (17.858)***	0.321 (6.166)***	
		-0.401 (9.047)***	
Effect on role ambiguity			
CPMS > RA			
		-0.592 (13.764)***	0.351

CPMS=Comprehensive PMS; RA = Role ambiguity; JP = Job performance
Each cell reports the path coefficient (t-value); * p<0.10, ** p<0.05, ***p<0.01 (one-tailed)

The significance of the indirect effect was also assessed using Sobel test (Sobel, 1982). The indirect effect between CPMS and job performance consists of the following paths: *CPMS – ROLEAMB – JOBPERF* indicating the indirect effect exclusively via role ambiguity. From the estimation of standard deviation presented in Table 7, the T-values related to the indirect effect were found to be statistically significant at 1% significance level. Thus, this finding confirmed the mediating effect of role ambiguity in the relationship between CPMS and job performance.

TABLE 7
Analysis of the Indirect Effects (n = 120)

Indirect effect CPMS on JOBPERF through	Indirect effect coefficient	Standard deviation of coefficient	t-value
ROLEAMB	0.326	0.059	5.515

Note: CPMS = Comprehensive PMS; ROLEAMB = Role ambiguity; JOBPERF = Job performance
All t-values are statistically significant at the 1% level (one-tail test). Formula for the standard deviation of coefficient is presented in Appendix A. Indirect effect coefficients were calculated using unstandardised path coefficients.

Moderated Regression Analysis was used to test the moderation effect of LOC, whereby X_1 is CPMS; X_2 is LOC, and Y is role ambiguity. Table 8 shows there is no evidence of moderation ($F = 15.926$, $p > 0.10$) when CPMS interacts with LOC on job performance. This shows that the inclusion of the interaction terms between CPMS and LOC has not significantly improved the model, as the F change shows insignificant values ($p>0.1$). Hence, H4 is not supported.

TABLE 8
Hierarchical Regression Results for Testing Moderating Effects of LOC between CPMS and Job Performance (n = 120)

Dependent variable	Independent variable & moderator variable	Standardised beta	p-value	R^2	F	Sig F change	Findings
JOBPERF	CPMS	0.266	0.210	0.285	45.379	0.000	H4 Not supported
	LOC	-0.469	0.254	0.288	22.873	0.461	
	CPMS*LOC	0.635	0.191	0.299	15.926	0.191 (ns)	

* p<0.10, ** p<0.05, ***p<0.01 (two-tailed)
Note: CPMS = Comprehensive PMS; ROLEAMB = Role ambiguity; LOC = Locus of control

TABLE 9
Hierarchical Regression Results for Testing Moderating Effects of LOC between CPMS and Role Ambiguity (n = 120)

Dependent variable	Independent variable & moderator variable	Standardised beta	p-value	R2	F	Sig F change	Findings
ROLEAMB	CPMS	0.036	0.858	0.294	47.847	0.000	H5 Supported
	LOC	1.230	0.002	0.295	23.812	0.714	
	CPMS*LOC	-1.437	0.002	0.350	20.312	0.002	

* p<0.10, ** p<0.05, ***p<0.01 (two-tailed)
Note: CPMS = Comprehensive PMS; ROLEAMB = Role ambiguity; LOC = Locus of control

On the other hand, in Table 9, the inclusion of the interaction term between CPMS and LOC on role ambiguity has significantly improved the model. The result indicates statistically significant evidence of moderation ($F = 20.312$, $p < 0.01$) when LOC interacted with CPMS on role ambiguity ($b = -1.437$, $p < 0.01$). The result shows a negative interaction which indicates that the comprehensiveness of PMS will result in lower role ambiguity with lower values of LOC (Hartmann & Moers, 1999).

DISCUSSION

Consistent with MAS literature, this research provides evidence of the moderating effect of the locus of control only in the relationship between CPMS and role ambiguity. Prior literature has identified the

difference in the use of MAS information between internal and external locus of control personality (Chong & Eggleton, 2003). Internal locus of control managers would be able to perform more effectively than their "external" counterparts, in high task uncertainty situations, through greater utilisation of broad scope MAS information such as Balanced Scorecard (BSC) in their decision-making processes. The finding is also consistent with Brownell (1981) who identified that the positive effect of traditional PM such as budget on performance for individuals who have a large degree of control over their destiny (i.e., internal locus of control) than the external locus of control managers. Thus, findings of the research suggest that the behavioural implications of CPMS could be influenced by managers' locus of control personality. In particular, behavioural implication of CPMS is different between managers who have a large degree of control over their destiny (internal) or managers who perceive that their destiny is controlled by luck, chance or fate (external). Managers with internal and external locus of control personality perceive, process, utilise and react to information differently.

Theoretically, this research contributes to the existing literature on MAS, particularly, the PMS design. Drawing on the social learning theory, research contributes to further examine the moderating effects of personality variable, LOC, in the context of PMS. Prior research that examined the moderating effects of evaluative process, complexity, and managerial experience in the relation between PMS and performance (Burney & Widener, 2007). The findings of the current research show moderation effect is identified only in the relation between CPMS and role ambiguity. Practically, this research is expected to provide evidence in relation to PMS practice among the Malaysian manufacturing companies. This research is also subject to a few limitations that are common across many quantitative studies. First, the questionnaire survey is the main data collection method used in this study, whereby the survey might not reach the intended respondents. Therefore, future studies should consider examining the same topic but adopt an in-depth qualitative case study approach to obtain further insight of the relationship. Secondly, the sample was drawn from only the manufacturing sector which might have limited the generalisability of the findings.

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