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THE MEDIATION EFFECTS OF BUYER-SUPPLIER INTEGRATION ON THE RELATIONSHIP BETWEEN SUPPLIER-SPECIFIC INVESTMENTS AND SUPPLIER-OPPORTUNISM

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ABSTRACT

This research concerns opportunism in a buyer-supplier relationship. Based on transaction cost and relational contracting theories, it examines the mediation effects of the buyer-supplier integration on the relationship between supplier specific investment and opportunism. Mediation effects were estimated using structural equation modelling based on a survey of 111 key informants in the public health facilities in Tanzania. The unit of analysis is the exchange relationship between the Medical Supplies Department (MSD) and the public health facility. The analysis revealed that the buyer-supplier integration negatively mediates the effects of supplier-specific investments on opportunism. In this research, external validity is limited due to a highly regulated environment; as such, more studies should be conducted in different contexts, e.g. culture. The findings from this study have both managerial and theoretical implications. First, purchasing managers should exert more efforts in developing closer relationship with the supplier to mitigate opportunistic behaviours. Second, the government should consider enforcing MSD to make specific investments not only as a means for solving moral hazard problems but also as a means for encouraging and enforcing the development of close co-ordination between the actors. Theoretically, this paper has contributed to the transaction cost theory by indicating that specific investments may not always stand as direct control mechanisms towards opportunism; instead, they can also lead to the development of other relational mechanisms which are effective in mitigating opportunistic behaviours.

Keywords: *Buyer-supplier integration, Supplier-specific investment, Opportunism.*

INTRODUCTION

Opportunism is a central premise of the transaction cost analysis theory (TCA), which accounts for the role of governance mechanisms in limiting opportunistic behaviours in a buyer-supplier exchange relationship (Williamson, 1985). According to Williamson (1975), opportunism is a lack of candour or honesty in transactions; it includes self-interest seeking with guile. This includes *ex ante* and *ex-post* the transaction, of interest here is *ex-post* opportunism. *Ex post* opportunism, on the other hand, is the failure of an exchange partner to perform without guile (John 1984; Williamson 1975).

In a buyer-supplier exchange relationship, opportunism has received considerable attention from both scholars and practitioners (Heide & John, 1990; Joshi & Arnold, 1997; Lui *et al.*, 2009). The importance of the right governance mechanisms to manage the exchange relationship has also been over-emphasised (Heide & John, 1990)

Governance mechanisms are tools that are used to establish and structure exchange relationships (Heide, 1994). Today, we know about market, hierarchy and hybrid governance mechanisms as relevant in a buyer-supplier context. Williamson (1985) further suggests that governance structures differ in their capacities to respond effectively to disturbances such as opportunism. The inter-organisational relationship literature further suggests that, buyer-supplier relationships exposed to opportunism require specific governance mechanisms, and that the market mechanism may not always be effective.

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According to the TCA, transaction specific assets (TSA) constitute a governance mechanism as specific investments dedicated to an exchange relationship mitigate opportunistic behaviours from the investor (Anderson & Weitz 1992; Williamson, 1985). Other scholars offer conflicting suggestions. Brown *et al.* (2000), for example, have noted that TSA on its own is insignificant. These inconsistencies suggest that the link between TSA and opportunism remains blurred.

Moreover, the main focus of TCA has been on mitigating opportunism of an exchange (receiving partner) by assuming TSA as an exchange hazard factor. This suggests that, the existing literature has ignored the fact that, the investor may be motivated to behave opportunistically by other factors.

This paper argues that suppliers with TCA to the buyers may still behave opportunistically if there are other stronger conditions to motivate them to do so. For example, when the buyer is dependent on them, or if a supplier has a monopoly power. Under this scenario, the role of specific investments to mitigate supplier opportunism may not be always effective. This implies that supplier-specific investments may not be effective in reducing supplier opportunism in such exchange relationships. Therefore, this paper examines the role of supplier-specific investments in fostering supplier opportunisms in a context where the buyer is strongly dependent on the supplier.

In this regard, the TCA perspective suggests that specific assets surrounding inter-firm exchange is a basic factor that evokes shifts in the mode of governance from conventional markets to bilateral (relational) governance or buyer-supplier integration (Andersen & Buvik, 2001; Williamson, 1981). In fact, the evidence on relational contracting suggests that hybrid modes/bilateral governance modes are effective in reducing opportunism (Andersen & Buvik, 2001; Heide & John, 1992). Despite the existing evidence, the link “*specific asset investment-relational governance-opportunism*” remains largely unclear.

In this paper, relational mechanisms include the extent to which information exchange and joint action in solving problems (Heide & John, 1992) constructed as buyer-supplier integration. Therefore, Buyer-supplier integration refers to information sharing and collaboration between a health facility and its focal supplier (Kahn & Mentzer, 1996).

Generally, the literature on the supply chain management has been dominated by the product-based industries with little implications from the service industry which includes the health sector. Yet, the health sector is a unique sector, which uses a variety of supplies, and selection depends on physicians/doctors’ preferences which differ from the manufacturing setting. Supplies are critical to the health of the public, and supply chain management critically influences clinical operations. This paper, therefore, contributes to the existing knowledge on the implications of buyer-supplier integration for the health care environment.

Inspired by both transaction cost analysis (Williamson, 1975, 1985) and relational exchange theory (Dwyer *et al.*, 1987; Macneil, 1980), this paper posits that, buyer-supplier integration mediates the effects of supplier-specific investments on opportunism. The model (Figure 1) was tested on Tanzania’s public health system² while controlling for geographical location (rural/urban). The central question was: “Does the buyer-supplier integration mediate the effects of supplier-specific investment on supplier opportunism?” To answer this question, this paper had two specific research objectives:

- (i) To examine the effect of supplier-specific investment on supplier opportunism
- (ii) To examine the mediation effect of buyer-supplier integration on the relationship between supplier-specific investments and supplier opportunism.

This study makes several contributions that are specifically important to the intersection between TCA and relational view which provided a theoretical lens to grasping the buyer-supplier integration. We go beyond and include both variables as governance mechanisms which mitigate opportunism, and establish the relationship between them in their co-existence.

² In Tanzania, the national drug supply is mainly dominated by a sole supplier, the Medical Supplies Department (MSD), which has been mandated to procure, distribute and store medicines and other medical supplies on behalf of public health facilities. However, the MSD has also made its logistics specific investments to deliver services to the health facilities.

THEORETICAL FRAMEWORK, RESEARCH MODEL AND HYPOTHESES

This paper employed two theoretical perspectives: (1) transaction cost theory is used to explain the role of transaction specific investments whereas (2) relational contracting theory explains the role of buyer-supplier integration (a relational governance mode) in mitigating opportunism.

Generally, opportunism refers to a lack of candour or honesty in transactions to include “self-interest seeking with guile” (Williamson 1975). It includes withholding or distorting information to “mislead, distort, obfuscate, or otherwise confuse” (Williamson, 1985). It can also include shirking i.e. not delivering the promised action (Hardy & Magrath, 1989). In a health care setting, a supplier of medical supplies for example, essential medicines may try to reap profits by not delivering supplies on time, or even delivering close-to-expiry medicines. The literature provides evidence on the role of governance mechanisms in mitigating opportunistic behaviour.

According to Benton and Maloni (2005), governance is essential in ensuring the stability of buyer-supplier relationships. It involves actions and mechanisms that influence how the buyer and supplier behave, hence leading to the fulfilment of joint objectives. Generally, the buyer-supplier exchange relationships are exposed to conflicts due to goal differences, opportunistic behaviours, unexpected changes in the market, differences in operational routines (Jap & Ganesan, 2000; Mohr & Spekman, 1994).

Informed by the transaction cost theory (TCT) and the relational contracting theory (RCT), buyer-supplier exchange relationships are governed by transactional and relational governance mechanisms (Heide & John, 1992). The transaction cost theory posits that asset specific investments are transactional mechanisms and incentive tool (Wathne & Heide, 2000). As it is difficult to redeploy these assets, they inhibit partner opportunism.

Relational mechanisms have been proved to be effective in controlling opportunism and nourish cooperation in buyer-supplier relationships (Heide & John, 1992). Relational mechanisms in buyer-supplier mechanisms curb opportunism because of the embedded-ness of social connections which generate standard of expected behaviour. Social bonds increase commitment of the exchange parties (*ibid.*).

Research model and hypotheses

In the research model, both direct and indirect paths to supplier opportunism were included as Figure 1 illustrates:

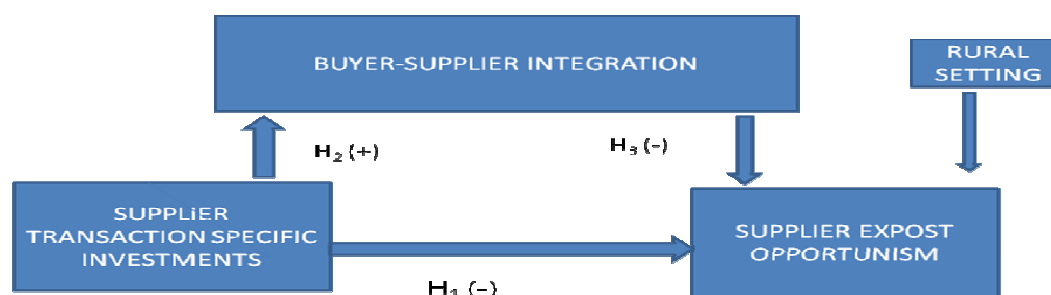


Figure 1: Research model

Implications of supplier specific investments for supplier opportunism

Transaction-specific assets (TSA) are assets with little or no value outside the focal exchange relationship (Williamson 1985). They may be in a form of specialised equipment and facilities (e.g. warehouses); site

specific; specialised training and experience; idiosyncratic intangible assets (e.g., information systems, inventory systems, management procedures), which cannot be transferred easily to another chain. Suppliers may decide to make such investments for three reasons: a) to improve the logistics systems to make them more efficient and effective; b) to signal their honourable intentions (continuity in relationship) with respect to their exchange partner (Mishra *et al.*, 1998); or c) they may be required as performance bonds to be forfeited if the firm is behaving opportunistically. Explicit in the bonding motive is the potential for economic loss in case the relationship is terminated because the assets cannot be redeployed in other exchange relationships. Therefore, the supplier engagement in opportunistic behaviour and risking the dissolution of the relationship is contrary to the “self-interest of the channel member that has made idiosyncratic investments” (Anderson and Weitz 1992). It is expected that, TSA is substantially reduced when the relationship is terminated because of opportunism (Doney & Cannon, 1997). This risk tends to restrain suppliers from misbehaving (Stump & Heide 1996). Therefore, it is hypothesised thusly:

H₁. There is a negative association between supplier-specific investments and supplier opportunism

Mediation effect of the buyer-supplier integration

Although specific investments provide economic constraints to opportunism, in a certain context it may prove differently particularly for B-S relationships in a regulated environment such as public health sector in Tanzania where the supply of essential medicines is solely done by a single government agency in this case, the MSD. This situation creates power asymmetry accompanied by buyer lock-in conditions, hence the existence of a powerful supplier. However, the supplier is also locked-in through specific investments made, in such long-term conditions specific investments, which may contribute to development of effective relational mechanisms.

The expectation is that the supplier invests in specific assets tailored to meet the need of its buyer. In this regard, they are bound in the relationship with that buyer. By itself this motivates the supplier to develop close relationships with the buyer to ensure effective continuity with the relationship. Close relationship build through information exchange and collaboration will lead to the development to relational values which by themselves can mitigate supplier opportunism. Based on the relational contracting theory, relational exchange limits opportunism through the sharing of norms and values (Heide & John 1992). Thus, effective relational exchange appears to build commitment to the relationship, which in turn leads to less opportunistic behaviour (Gundlach *et al.*, 1995).

Based on these arguments, it is hypothesized as follows:

H₂. There is a positive relationship between supplier-specific investments and buyer-supplier integration

H₃. Buyer-supplier integration negatively mediates the effects of supplier-specific investment on supplier opportunism

RESEARCH METHODOLOGY, MEASURES AND VALIDITY ASSESSMENTS

Empirical Setting and Data Collection

Data was collected using a survey of 111 public health facilities in Tanzania, categorized as hospitals, health centres and dispensaries. Stratified random sampling was used to generate the sample. The unit of analysis was a dyadic exchange relationship between a public health facility and its focal supplier, the MSD. The study focused on the MSD because it is a sole supplier of medicines and other medical supplies to public health facilities in Tanzania. A questionnaire was developed using measures (in a seven-point likert scale) adapted from previous studies. Key informants (purchasing managers) were asked to fill out the self-administered questionnaires. The average work experience of the key informants was six years. These had sufficient experience with respect to the purchasing practices and supplier evaluations.

Measure Development

This section describes the basic contents of the constructs (see Table 1) appearing in the research model (Figure 1). All the measures were adapted from previous similar studies (see details in Table 1).

Table 1: Scales and Reliability Measures

Scales:	Sample of items. <i>Response format</i> : 7-point Likert-type scale with end points inaccurate description and accurate description.
SASPEC Supplier specific investments 5 items $\alpha=0.83$	SAP1: The MSD has made extensive investments in information technology in order to process our order information. SAP2: The MSD has made significant adaptation through extra expansion of their zonal warehousing storage capacity in order to meet our needs. SAP3: The MSD has made significant adaptation in their zonal warehouse through personnel trainings on the use of the Integrated Logistics System. SAP4: The MSD has tailored its zonal warehouse routine workflows to the specific needs of our ordering routines. SAP5: The MSD has made specific investments in picking and packaging systems to handle our orders.
SUPINTEG Buyer-supplier integration 6 items $\alpha= 0.84$	SUPINTEG1: Our purchasing unit and the MSD always work together as a team to solve essential drug supply-related problems. SUPINTEG2: Our purchasing unit and the MSD always work together in following up of our essential drug orders sent. SUPINTEG3: Our purchasing unit always collaborates closely with the MSD on quality control of delivered essential drugs. SUPINTEG4: Our purchasing unit always collaborates closely with the MSD on quality control of delivered essential drugs. SUPINTEG5: Our purchasing unit and the MSD have closely integrated the supply of essential drugs and other drugs in vertical programs. SUPINTEG6: Our purchasing unit and the MSD always hold periodic meetings to plan for our drug supply.
OPPOR Supplier's opportunism 7 items $\alpha=0.92$	OPPO1: MSD often acts to benefit itself at our expense. OPPO2: MSD lacks integrity when not closely monitored. OPPO3: MSD often breaches our agreements so as to maximise its own gains. OPPO4: MSD sometimes distorts information for its own interests. OPPO5: MSD often promise to do things without actually doing them later. OPPO6: MSD sometimes delivers drugs with close-to-expiry dates to benefit itself at our expense. OPPO7: MSD lies to us about certain things to protect their interest.

Buyer-supplier Integration (SUPINTEG). This construct measures the extent of inter-firm coordination/information exchange and collaboration/joint action between a public health facility and its focal supplier of essential medicines, and is measured by 6 items.

Supplier specific investments (SASPEC): This construct measures the extent of supplier dedicated logistical assets (human, instruments, equipments, facilities) in the relationship with the buyer.

Supplier opportunism (OPPOR): This measures the degree of supplier opportunistic behaviours in the relationship with the buyer.

Geographical Location (GEO): This is a dummy variable that indicates the location of the public health facility in a rural (value1.00) or urban (0) council.

Validity Assessments and Descriptive Statistics

Exploratory factor analysis extracted three factors, which explained 61% of the total variance.

Table 2: Correlation Matrix, average variance extracted (AVE) and Descriptive Statistics

Constructs	1	2	3	Mean	Std
1. OPPOR	1	0,057249	0,0543	4,0578	1,49
2. SASPEC	-0,239**	1	0,163445	4,5748	1,416
3. SUPINTEG	-0,233*	0,404**	1	4,0631	1,195
4. GEO	-0,163	-0,0367	-0,072		0,436
AVE	63%	40%	40%		

Note: Values above the diagonal are the shared variances between constructs whereas those below the diagonal are inter-construct correlation estimates. *Correlation is significant at the 0.05 level (2-tailed).

All factor-items loadings were above 0.4 for each of the constructs, and indicate satisfactory internal consistency (Hair *et al.*, 2006). All the constructs had Cronbach alpha values of above 0.7 (confer Table 1) and further support the satisfactoriness of data reliability (Nunnally, 1981; Pallant, 2010).

Confirmatory factor analysis (CFA) carried out by Amos resulted in satisfactory model fit indices were; $\chi^2 = 244.794$ df 161, $p < 0.01$, IFI = 0.91; TLI = 0.90; CFI = 0.913, and all indices fell within the cut-off point of 0.9 (Byrne, 2010), and the RMSEA value (0.06) was within the 0.08-limit as proposed by Byrne (2010). In addition, all the factor loadings were significant and greater than 0.5 with t-values > 2.00 , and demonstrate satisfactory convergent validity for the model (Droge *et al.*, 2004).

Discriminant validity was assessed using the procedures of Fornel and Larcker (1981). The estimated average variance extracted (AVE) was greater than the percentage of variance shared by each construct (Table 2) except for buyer-supplier integration (SUPINTEG) and supplier specific investments (SASPEC) which had AVE-scores slightly below 0.5. However, the discriminant validity assessments revealed that SUPINTEG satisfied the other criteria above and support satisfactory discriminant for the research model. The low AVE values may be explained by the fact that this is the first time the variable is tested in a health care setting.

Data analysis and empirical finding

Model estimation

In this paper, a structural equation modelling (SEM) was used to estimate the mediation effects because of its ability to include both predictor and mediation variables in a single model (Baron & Kenny, 1986).

Mediation analysis

Following Baron and Kenny's (1986) approach, this study estimated both direct and indirect effects of supplier-specific investment on supplier opportunism. In model 1 (Figure 2) a direct link between supplier-specific investment and opportunism was established. It was observed that supplier-specific investment directly influences supplier opportunism (Table 3).

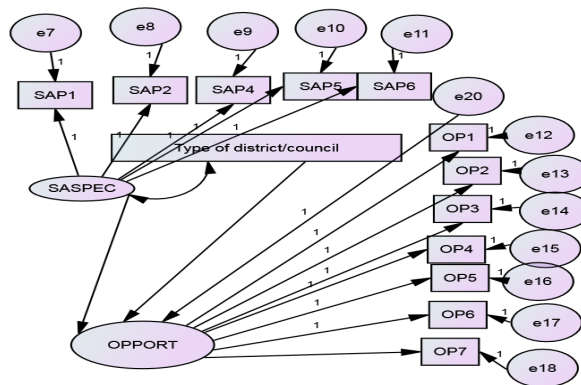


Figure 2: Direct relationship

Table 3: Direct relationship: regression results

	Estimate	S.E.	C.R.	P	IFI = 0.99; ILI = 0.988; CFI = 0.98. RMSEA = 0.03
OPPORT <--- SASPEC	-0.302	0.137	-2.201	0.028	
OPPORT <--- GEO	-0.688	0.320	-2.152	0.031	$X^2 = 77.015$; $df = 69$; $p > 0.05$

Model 2: Next, buyer-supplier integration was added in the original model (as Model 2 Figure 3 illustrates), and it was observed the direct link from supplier specific investment to opportunism was not significant (Table 4).

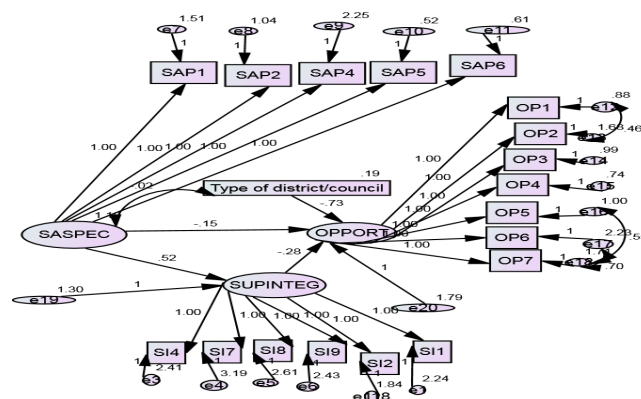


Figure 3: Mediation model

Table 4: Regression weights

			Estimat	S.E.	C.R.	P	Model fit
SUPINTEG	<---	SASPEC	,525	,125	4,202	***	IFI = 0.96; ILI = 0.958; CFI = 0.96. RMSEA = 0.047 X ² = 196.824; df = 159; p <0.02
OPPORT	<---	SUPINTEG	-,286	,138	-2,064	,039	
OPPORT	<---	SASPEC	-,15	,156	-1,002	,316	
OPPORT	<---	GEO	-,73	,313	-2,367	,018	

Dependent variable: Opportunism

Tables 4 and 3 above show that both two models indicate a satisfactory model fit, RMSEA below 0.08 (Byrne (2010)). Moreover, all the indices (IFI, ILI, and CFI) were within the threshold of 0.9 (Byrne, 2010).

FINDINGS, DISCUSSIONS AND CONCLUSIONS

This study controlled for the type of district/council (rural/urban) of the health facility (GEO). The results show that GEO has a significant and negative effect on supplier opportunism ($b = -0.73$, $t = -2.367$, $p < 0.05$), which implies that public health facilities in rural district councils experience low supplier opportunism than those in urban councils.

Model 1 estimated the direct effects of supplier-specific investments (SASPEC) on supplier opportunism (OPPORT). The results show that supplier-specific investments significantly reduced supplier opportunism ($b = -0.302$, $t = -2.201$, $p < 0.05$).

After introduction of the mediator variable (Buyer-supplier integration) Model 2, Hypothesis H₁ was insignificant ($b = -0.15$, $t = -1.002$, $p > 0.05$) implying that the power of supplier-specific investment (SASPEC) weakens in the presence of buyer-supplier integration. This is inconsistent with the Transaction Cost Theory, which posits that specific investments may be used as governance mechanisms to mitigate investor opportunism (Williamson, 1985). On the other hand, this finding supports previous scholars who suggest that specific investments may not mitigate opportunism (Brown *et al.*, 2000). The results further suggest that that in a situation where TSA is not a source of exchange hazard then it may not be an effective governance mechanism.

Results in Model 2 significantly support the view that the mediation effects were significant, hence Hypothesis H₂ was significantly supported (Table 4: $b = 0.52$, $t = 4.2.2$, $p < 0.05$), indicating that supplier-specific investments have a positively and significant effect on buyer-supplier integration. This implies that, supplier-specific investments contribute to the development of relational governance mechanisms "buyer-supplier integration".

Furthermore, hypothesis H₃ was significantly supported p ($b = -0.28$, $t = -2.064$, $p < 0.05$) shows that buyer-supplier integration (SUPINTEG) completely mediates the negative effects of supplier-specific investments on supplier opportunism. This result is consistent with other scholars who suggested that the link between specific investments and opportunism is insignificant (Brown *et al.*, 2000) and those who suggested that relational governance mechanisms are effective in mitigating opportunism. In the TCT, these results also support those who suggested that specific asset investments lead to the development of hybrid governance modes (Andersen & Buvik, 2001; Williamson, 1981). Thus in the presence of specific asset investments, bilateral governance through information sharing and collaboration may develop as a result of enforced co-operation between actors. As a result, relational values develop which motivate the supplier's desire to safeguard the relationship hence chances for cheating with other opportunistic behaviours reduced. This is constitutes a self-enforcing mechanism.

In addition, buyer-supplier interaction and joint problem-solving support actors to achieve a collective goal, understand the interdependence between each other, and enhance predictability of each party's actions. Reduction of uncertainty is considered key for reducing opportunistic behaviours. Frequent information sharing and joint problem-solving will support actors to build trust and social ties which are effective in mitigating opportunism.

Theoretical and managerial implications

Generally, this paper has covered further implications for the Transaction Cost Theory by showing that TSA on their own cannot mitigate opportunism of the same investing partner (supplier) when the supplier is powerful than the buyer. However, these assets will support development of bilateral governance mechanisms (buyer-supplier integration) which are more effective in mitigating supplier opportunism.

As a response to the call for more research in supply chain management in the health care environment, by examining the mediation effects of buyer-supplier integration on the link between supplier specific investments and supplier opportunism, this study offers more knowledge and additional understanding of the role of integration practices within the health care industry. It also brings forward the discussion on effective governance mechanisms in mitigating moral hazard behaviours in a health facility-supplier relationship. This study places health facility-supplier integration as key governance mechanism.

To the practitioners, this paper underscores the importance of ensuring that specific investments develop relational governance mechanisms. What this suggests is that more efforts should be directed towards the latter.

Limitations and recommendations for future research

This study faces the normal limits of survey research. After all, a cross-sectional study does not allow for the establishment of causality between the predictor-mediator and dependent variable. In addition, this study is also subjected to common method bias problems because data collection was only limited to the buyers' perceptions. Thus, it is important that future research will also include suppliers' opinions. The potential for common method bias was checked using Harman's single factor statistical test which indicates common method variance problems. Based on the recommended criteria, common method variance was not detected as a problem because the exploratory factor analysis identified several factors and the first factor did not account for the majority of the variance (Podsakoff *et al.*, 2003).

Furthermore, the low AVE values for buyer-supplier integration and supplier-specific investments observed suggest that somehow the results should be interpreted with caution until the realisation of further validation. The results may be validated in other sector, as this was carried out in a public health system, which is highly regulated.

To conclude, this paper has examined the influence of supplier-specific investment on supplier opportunism, and the mediation effects of relational governance mechanisms (buyer-supplier integration) on supplier opportunism. The empirical result shows that in the long-term exchange relationship between a health facility and its focal supplier, accompanied by establishment of high levels of information sharing and collaboration will experience low supplier opportunism.

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