

MEDIATING ROLE OF FIRM SIZE FOR ETHICAL E-PROCUREMENT IMPLEMENTATION: EMPLOYEE PERCEPTION FROM SMES

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Abstract

The current study examines the mediating role of firms' size between perceived benefits and perceived implementation of cost for ethical e-procurement implementation in small and medium size firms of Sindh, Pakistan. For the achievement of research objectives, the required primary data gathered using the adopted questionnaire and the researcher used survey method. Total 300 questionnaires distributed among middle level and upper-level employees and 270 filled questionnaires returned for further analysis and data cleaning process. The response rate was 90 percent. Confirmatory factor analysis and SEM analysis performed in AMOS version 25 for the study of the collected data. The study's findings supported the hypotheses that both perceived benefits and perceived costs have a partial mediating influence on the adoption of ethical e-procurement in small and medium-sized businesses in Sindh, Pakistan. The result of study are insights for the top management and managers of SMEs in order to arrange workshops intended for employees for better implementation of ethical e-procurement in small and medium size firms situated in Sindh, Pakistan.

Keywords: Firm size; Perceived benefits; Perceived implementation cost; Ethical e-procurement implementation

INTRODUCTION

The procurement, the complex process carried within organizations for acquiring the goods and services against certain amount (Robinson et al., 2010). Though, when the technology involved into procurement process then it is called the e-procurement (Muffato & Payaro, 2004; Garrido et al., 2008; Abu-Elsamen et al., 2010). Many benefits enjoyed through the e-procurement such as reduced lead time (Lefebvre et al., 2005), smooth process (Teo et al., 2009), reduced cost of material and services (Gunasekaran & Ngai, 2008) and so many other options available among competitive markets (Gunasekaran et al., 2009).

The multiple functions performed suitably with the help of e-procurement through the search of suppliers acquired the goods and services in a timely manner (Teo et al., 2009), and goods and services usually purchased as per required specification (Wu et al., 2007). Furthermore, the contribution of e-procurement at large scale has positive and significant impact not only on company but also to overall national productivity in both developed and developing countries (Muffato & Payaro, 2004). However, many countries particularly the developing countries can adopt the e-procurement in firms due to lack of advanced technology adoption and implementation measures in business operations (Ernst & Young, 2001).

The SMEs usually avoided the disclosure of financial statement to public. In order to invest in technology such e-procurement within organizations mostly relied on the financial institutions such as banks being the main source of funding (Benfratello et al., 2008). However, due to lack of strong collateral SMEs are unable to seek sufficient funds for the implementation of technology such as e-procurement in business operations. In result, most of SMEs do not get financial capital for adoption of advanced technology (Calcagmini et al., 2011). The advanced technology such e-procurement plays vital role mostly for positive outcomes including growth, sustainability and business success (Budiarto and Pramudiati, 2018). In addition to these benefits, there occurred

some environmental challenges nowadays due to the induction of new technologies in phenomenon, which are forcing towards green supply chain in all aspects of supply chain management including procurement (Wu et al., 2014; Soosay et al., 2014). Implementation of technology in the form of e-procurement is the internal procurement and it has positive impact on integration of suppliers and customers' satisfaction as results (Devaraj et al., 2007).

Present study put few contributions in the field of knowledge. First, many studies conducted on e-procurement in developed countries but a few attempts made in regard of the developing countries and limited only to binary measures (Wu et al., 2007; Pearcy et al., 2008). The current study attempts to find the insights from the developing country, Sindh, Pakistan. Secondly, in the past studies only limited functions covered without any mediating variable, these functions included e-sourcing, e-informing and InterOS and, so on (Wu et al., 2007). Thirdly, in the past studies the role of technology used in order to verify the SMEs performance (Budiarto and Pramudiati, 2018). However, in the present study the firm size is considered as a mediating variable in order to find out the role of implementing e-procurement within firms.

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Theoretical framework

In Diffusion of Innovation Theory (DOI theory), Rogers., (1962;2003), suggested about the diffusion of innovation in the shape and form of (e-procurement) among the social systems through communication channels with respect to passage of time. In social systems, believed that firms consist of individuals or group of people working for the common goals and objectives within the firm. These people play a vital role for implementation of the ethical e-procurement with consideration of procurements' benefit to the organization. In addition, this theory suggested that the adopters belonged to formal groups as well as informal groups within the organization. The role of adoption affected due to the complex organizational structure and organizational openness.

Hypothesis Development

Perceived Benefits

The most organizations take keen interest in order to implement e-procurement in the purchase process, the management of the organization believed in this exercise had brought perceived benefits (Teo et al., 2009; Au et al., 2014). These benefits included increased customer service, decreased transaction cost and minimum transaction error and, so on (Teo et al., 2009; Dauda and Lee, 2016).

In addition, the papers' cost also get reduced with the outcome of reduced order cycle (Min & Galle, 2003; Cao et al., 2020). The perceived benefits explored in the studies (Teo et al., 2009; Min & Galle, 2003). E-procurement got attention in business operations and led to various benefits such as time saving and, so on (Bartezzaghi et al., 2005; Nawi et al., 2016). The profitability of firms along with the control can sufficiently achieved through e-procurement. The firms earned an intangible benefit known as company's reputation useful in the competitive business environment and provided protection from the management fraud (Panda and Sahu, 2010). Therefore, following alternative hypothesis developed in the light of above given past studies.

H1a: Perceived benefits positively related to ethical e-procurement implementation.

Perceived Implementation Costs:

In order to compete the counterparts in the existing market, suggested that the firms must work on the reduction of costs particularly purchasing costs (Emiliani, 2000; Miyatake et al., 2016). One way of reducing the purchasing costs of material via open bidding through internet (Chong et al., 2009; Yao, 2008). The e-procurement not only tended to reduce the price from the suppliers but had also significantly impacted the procurement process (Masudin et al., 2021). The cost benefits cannot be ignored via implementation of e-procurement within firms. In addition to visibility and transparency in purchasing process also important element and not be ignored (Parida, 2006). Consequently, following alternative hypothesis have been developed in the light of above past studies.

H2a: Perceived implementation costs positively related to ethical e-procurement implementation.

Mediating Role of Firm Size

Firm size

The size of firm mainly determined through annual sales turnover or sometimes through

number of employees working within the organization (Teo et al., 2009; Ogechukwu, 2011). Mostly, the firms operated at large scale had received more benefits from the implementation of e-procurement due to enhanced number of transactions (Batenburg, 2007; Eei et al., 2012; Tai et al., 2010). In this regard, the firms, worked at large scale, used to gain more benefits as compared to the firms of small size (Soares-Aguiar et al., 2008; Teo et al., 2009; Min & Galle, 2003).

It is practically observed that the firm size matters for implementation of ERP in small size firms as compare to large size firms (Vanpoucke et al., 2014). Mostly, people agreed on the view that internal management could help to achieve the sustainability in SMEs (Sharma, 2011). Additionally, the large-scale firms had different approaches in context of supply chain management in comparison of small size firms and such large firms mainly work towards entire supply chain management (Inayatullah & Singh, 2015). The large-scale firms had more human resources and financial capital for implementing the e-commerce and related e-supply strategies within the firm (Wagner et al., 2013; Fawcett et al., 2009). Thus, the following alternative hypotheses are suggested on the basis of above-described past studies.

H1b: Firm size mediate the relationship between perceived benefits and e-procurement implementation.

H2b: Firm size mediate the relationship between perceived implementation costs and e-procurement implementation.

METHODOLOGY

In the present study the primary data collected for achieving the research. Primary data gathered and when the data required is not available in the primary form, the researcher approached towards secondary data (Sekaran and Bougie, 2009). The population of present study is small and medium size firms, which are operational in Sindh, Pakistan. The employees from private hospitals working in the supply chain management department and particularly in procurement department were requested to fill the questionnaires on voluntarily grounds on printed form. Total 300 questionnaires distributed among private hospital employees and 270 filled questionnaires returned for further analysis of data and data cleaning process. Therefore, the response rate of 90 percent and considered good in the field of social sciences (Hair et al., 2010). Due to limited number of small and medium size firms that used e-procurement in purchasing process, the convenience sampling strategy related non-probability sampling considered for obtaining the research objectives of the current study. In the current study, it is bit difficult investigating the complete population, samples from the entire population taken for the current study based on the rule of statistical inference. As per a research study of Roscoe (1975), suggested the general guideline about the number of respondents to a questionnaire larger than 30 but fewer than 500. Multiple regression analysis included in the sample size for multidimensional research, as per the study of Roscoe (1975). The sample size, at least ten times as large as the number of study variables. The general formula for calculating sample size is Total number = (Number of Questionnaire Items x 10), or $16 \times 10 = 160$. However, for better and reliable results the 270 respondents taken in the present study.

The research instrument taken from past studies having the similar objectives in their respective context. The elements of perceived benefit taken from the study of Rankin et al., (2006), comprised of following research items “Benefits of enhanced level of efficiency in job delivery, Benefits of elimination of geographic barriers in procurement, Benefits of effective communication between project team members and Benefits of good inventory management and record keeping”.

The research instrument for perceived cost adopted from the study of Eadie et al., (2007), the research items used in the current study “Cost of acquiring and operating the package, less labor-intensive feature of e-Procurement, increase in profit margin associated with e-procurement and e-procurement has high running costs”.

The research instrument for firm size taken from the study of Hassan (2003), the items included “annual revenue affects e-procurement, number of employees affects e-procurement, number of IT staff affects e-procurement and number of suppliers affects e-procurement”.

Lastly, the research instrument for ethical e-procurement implementation also taken from the research of Hassan (2003). The research items comprised as follows “there is a pressure to use ethical e-procurement to meet suppliers' requirements, there is a pressure from the industry to use

ethical e-procurement as a standard of purchasing practice, an ethical e-procurement link to our suppliers is necessary to maintain our competitive edge and we feel it is a strategic necessity to use ethical e-procurement to compete in the marketplace”.

RESULTS AND DISCUSSION

4.1 Common Method Bias

The common method of bias suggested checking due to research instrument for the data collection. This is an important for the researcher while dealing with the human being as respondents. The opinion, perception and behavior may change person to person (Harman, 1967). In this context, the current study is highly recommended to test the common method bias Harman's single factor applied for ensuring to resolve the problems related common method bias. The recommended value should not more than 50 percent (Podsakoff et al., 2003). The findings of Harman's single factors given in the below Table 1 and value is 44.039 percentage, which is less than 50 percentage. Therefore, in the present there is no issue of common method bias.

Table 1: Common Method Bias

Total Variance Explained						
Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.046	44.039	44.039	7.046	44.039	44.039
2	2.036	12.727	56.767			
3	1.273	7.954	64.720			

Extraction Method: Principal Component Analysis.

4.2 Reliability and Validity of research instrument

The Table 2 represents the reliability and validity of research instrument of present study. It is highly suggested that the questionnaire should be reliable and validated before testing the hypotheses (Hair et al., 2010). Therefore, the confirmatory factor analysis conducted in AMOS version 25. It recommended that the value of Cronbach alpha, composite reliability and average variance extraction taken as the conclusion of research instrument reliability and validity. It can be judged from the Table 2, the value of Cronbach alpha and composite reliability found greater than the recommended value .70 and Cronbach alpha and composite reliability ranged from .875 to .708 and .71 to .88 respectively.

In addition of other facts, the validity of research instrument also confirmed by the value of average variance extraction. The suggested value of AVE should equal or more than .50 (Hair et al., 2010). In this regard, for present study AVE values ranges from .50 to .65. The AVE values also seen from the Table 2. The concluding remarks regarding the research instruments' reliability and validity confirmed and hypotheses testing conducted for achieving the research objectives of the current study.

Table 2: Construct Validity and Reliability

Factor	Coding of Item	Items loading	Cronbach's Alpha Value	Composite Reliability	Average variance Extraction
Perceived Benefit	PB1	.556	.708	.71	.50
	PB2	.680			
	PB3	.530			
	PB4	.685			
Perceived Cost	PC1	.744	.852	.85	.60
	PC2	.817			
	PC3	.828			
	PC4	.690			
Firm Size	FZ1	.726	.875	.88	.65
	FZ2	.849			
	FZ3	.820			

	FZ4	.827			
Ethical E-procurement implementation	EEP1	.679	.811	.81	.52
	EEP2	.754			
	EEP3	.819			
	EEP4	.627			

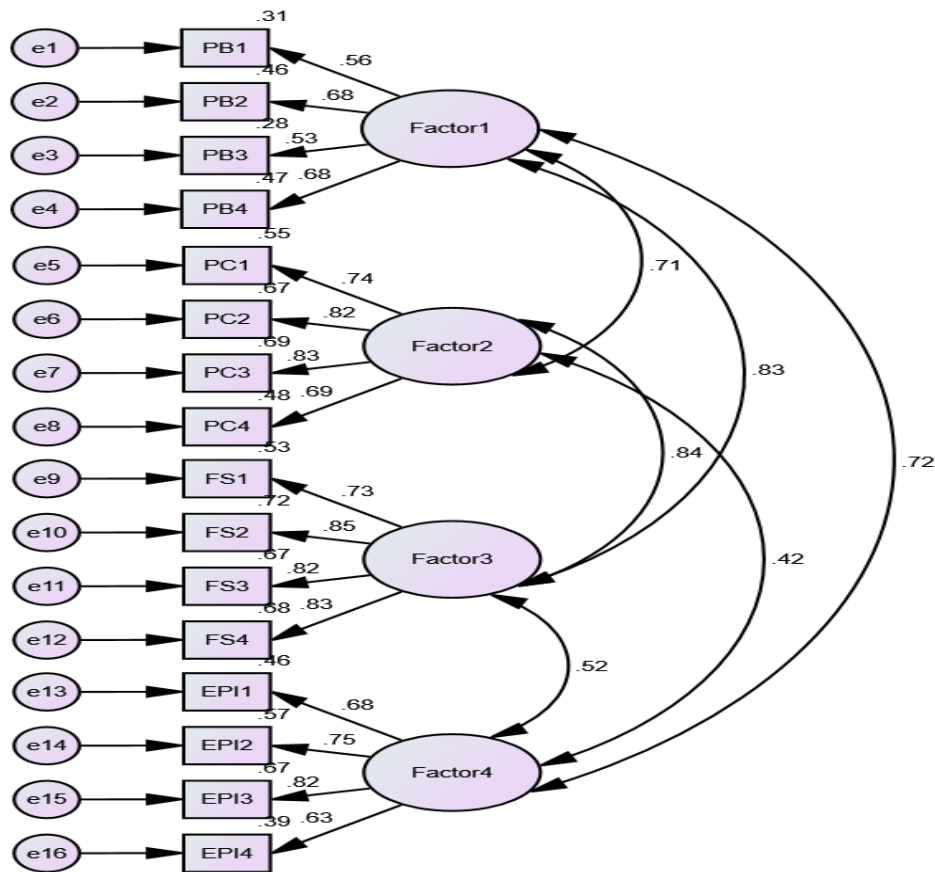


Figure 1: Confirmatory Factor Analysis

4.3 Discriminant Validity

The discriminant validity showed each variable in research study is different from other variable used in the research study, and each of the variables measuring a different concept with respect to other variables (Zait and Berteau, 2011). In the present study, the discriminant validity checked in SmartPLS version 3.2 via Fornell locker criterion (Hamid et al., 2017). The decision criteria are that the value of each factor should be greater than the other factors in the model. It can be noticed from the Table 3, the current study confirmed discriminant validity as the recommended decision criteria.

Table 3: Discriminant Validity

	Ethical e-procurement implementation	Firm Size	Perceived Benefit	Perceived Cost
Ethical e-procurement implementation	0.795			
Firm Size	0.491	0.857		

Perceived Benefit	0.572	0.656	0.729	
Perceived Cost	0.396	0.745	0.577	0.833

4.4 Mediation Analysis

Perceived Benefits

The role of firm size taken as a mediating variable and checked between perceived benefit and ethical e-procurement implementation. Research scholars suggested the verification of three effects including total effect, direct effect and indirect effect. Therefore, the first effect, namely total effect confirmed the positive and significant relationship between independent variable perceived benefit and dependent variable ethical e-procurement implementation with beta value=.552 and p-value=.000 respectively. Secondly, the direct effect between independent variable perceived benefit and dependent variable ethical e-procurement implementation with beta value=.385 and p-value=.000 respectively. Lastly, the indirect effect via role of mediating variable firm size revealed the positive and significant impact of variables with beta value=.134 and p-value=.003. Based on these results, present study's findings showed the partial mediation effect as concluded above and the value of beta also decreased from .385 to .134. Thus, the recommended hypothesis 1a and 1b supported. See the Table 4:

Table 4: Perceived Benefits (Mediation effect)

Path effects	Directions of Paths (SEM)	Path beta value	Sig value
Total effect	PB->EEPI	.522	.000
Direct effect	PB->EEPI	.385	.000
Indirect effect	PB->FZ->EEPI	.134	.003

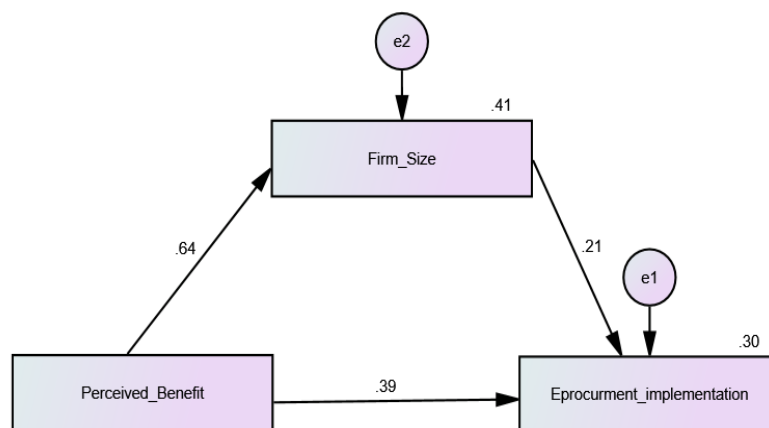


Figure 2: Structural Equation Modelling (Path Directions)

Perceived Cost

The role of firm size acting as a mediating variable checked between perceived cost and ethical e-procurement implementation. The research scholars of the domain suggested that, the three effects required verification, these effects include total effect, direct effect and indirect effect. Therefore, the first effect mentioned as total effect confirmed the positive and significant relationship between independent variable perceived cost and ethical e-procurement implementation with beta value=.367 and p-value=.000 respectively. Secondly, the direct effect between independent variable perceived cost and ethical e-procurement implementation with beta value=.060 and p-value=.000 respectively. Lastly, the indirect effect via role of mediating variable firm size revealed the positive and significant impact with the beta value=.307 and p-value=.003. Based on the present study's findings there exists a partial mediation effect and value of beta also

decreased from .367 to .307. Thus, the recommended hypothesis 2a and 2b supported. See the Table 5:

Table 5: Perceived Cost (Mediation effect)

Path effects	Directions of Paths (SEM)	Path beta value	Sig value
Total effect	PC->EEPI	.367	.000
Direct effect	PC->EEPI	.060	.000
Indirect effect	PC->FZ->EEPI	.307	.000

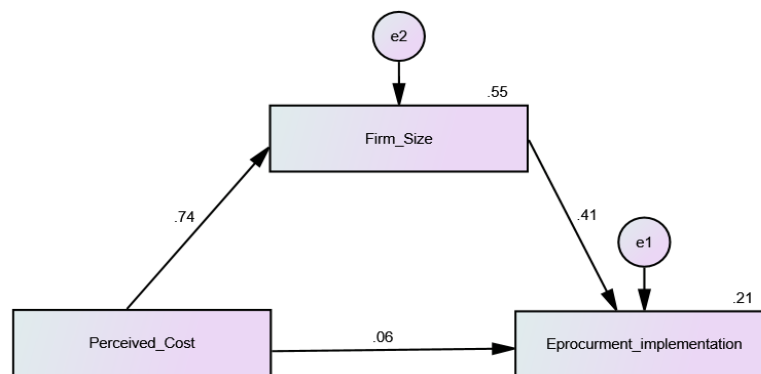


Figure 3: Structural Equation Modelling (Path Directions)

DISCUSSION ON RESULTS

The present study confirmed the partial mediating effect of firm size between perceived benefits and e-procurement implementation. Similarly, past studies also found role of perceived benefits for implementation of ethical e-procurement within firms. A recent study of researchers Eei et al., (2020), revealed positive and significant impact of perceived benefit on e-procurement. Another study by Vaidya & Campbell (2016), in the context of small and medium size firms confirmed the same behavior (positive and significant) of perceived benefit and e-procurement. Lastly, the recent study of Doley and Sharon (2018) observed the relationship between perceived benefits and e-procurement. In this study, concluded that there is significant impact of perceived benefits on e-procurement implementation in all sizes of firms.

In addition, present study also revealed the partial mediating effect of firm size between perceived cost and e-procurement implementation. The result of this study aligned with recent research study of Mohd Daud et al., (2013), explored a positive and significant impact of perceived cost on e-procurement. A similar type of study carried in Hong Kong, the researcher, Gunasekaran and Ngai (2018), found the cost as the key factor for firms decided either to go e-procurement or not. The firm size played a vital role for e-procurement implementation as evident from this study of Percy and Giunipero (2008), the researchers keenly observed and confirmed the role of firm size in Singapore. Furthermore, the Toortich (2008), confirmed role of firm size for e-procurement implementation in Kenya, gathered data from government's purchase departments. Lastly, the Ibem et al., (2018) confirmed the role of firm size for e-procurement implementation in small and medium size firms. Therefore, conclusively, current study confirmed the fact that the factor firm size cannot be ignored for successful implementation of e-procurement within firms.


CONCLUSION AND FUTURE RESEARCH

In this study primary data gathered through adopted questionnaire from middle level and upper-level employee, working in the small and medium size firms Sindh, Pakistan. Findings confirmed the role of firm size for both perceived benefits and perceived costs have a partial mediating influence on the adoption of ethical e-procurement in small and medium-sized businesses in Sindh, Pakistan. The result of study are insights for the top management and managers of SMEs in order to arrange workshops intended for employees for better implementation of ethical e-procurement in small and medium size firms situated in Sindh, Pakistan.

However, there are some limitations of this study. First, two variables are considered as an independent variable perceived benefits and perceived costs. In future more variables added such as employee training and consultancy services so on, which are also important for implementing the ethical e-procurement within firm. Second, this study is based on quantitative in nature in future qualitative study to be conducted through in-depth interview for understanding more insights from employees. Lastly, a serial mediation effect can check including age and experience of an employee for implementing the ethical e-procurement in small and medium size firms of Hyderabad, Pakistan.

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