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DETERMINANTS OF PUBLIC PROCUREMENT EFFICIENCY: A COMPREHENSIVE STUDY OF PUBLIC PROCUREMENT RULES OF PUNJAB, PAKISTAN

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ABSTRACT

This study explores the factors which ensure efficiency in public procurement through the economy and transparency. This paper examines the public procurement rules of Punjab 2014. The study is conducted in three stages. In the first stage, in-depth interviews are conducted by procurement experts to identify important factors which bring economy and transparency to the public procurement process. In the second stage, a comprehensive questionnaire is developed considering identified factors. Finally, various types of analyses are used to examine identified factors. The results of the study indicate that annual procurement planning, use of ICT, capacity building, strong redressal system, and tender financial limit are the key factors that bring efficiencies in public procurement. This paper contributes to understanding the core factors which may influence public procurement efficiency. The study ensures a healthy contribution in saving public funds by achieving efficiencies in public procurement.

Keywords: Public Procurement, Procurement Efficiencies, Procurement Planning, ICT

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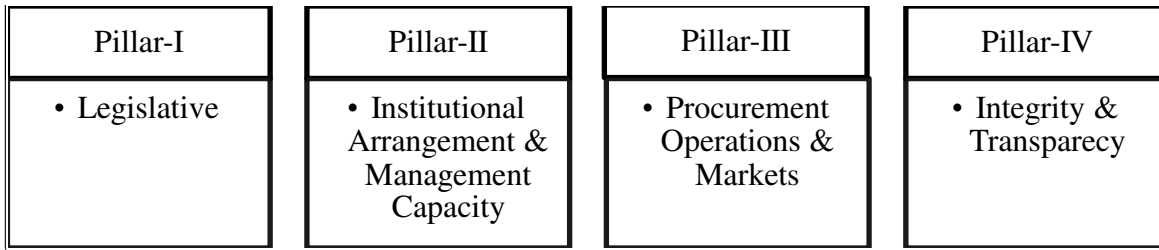
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I. INTRODUCTION

Government generates cash flows from many sources, mainly from its sources (revenues) and also in the form of grants and loans together called public money. The government spends public funds to acquire goods and services required for public projects. The government is an artificial person who delegates financial powers to the head of government functionaries to make expenditures in the best public interest. So, the public money must be spent in a way to get the utmost utility by observing the limits of the regulatory framework. During the last two decades, public procurement has advanced in most of the world economies but is handled by government officials with little experience in procurement policies and procedures. According to Maude (2011), many procurement professionals across government lack capability and market knowledge and therefore are process-driven. Resultantly, significant amounts of public funds have been lost owing to malpractices of suppliers and contractors. In this regard, the developed countries have already gone through reform processes in public procurement while developing economies are still indulging in the procurement reform process (Khan, 2018).

The economic development of any country is highly associated with transparent public procurement (Fernandes & Viera, 2015). The importance of public procurement is exhibited in that the countries spend almost 15-20% of their GDP on the acquisition of goods and services (Allen et al., 2016). This phenomenon is also supported in the existing literature Empirical evidence supports that procurement reforms improve the spending efficiency by 1 percent of GDP (Hussein & Najib, 2021). It can be concluded, savings from such mechanism then could be allocated to other depriving sectors like health, education, and municipal services, etc. in this way, effective policies of the public procurement systems may assist governments to reduce the burden on public budgets, achieving value for money, and provide better opportunities for private investments. Public procurement is also an important tool to promote national, and regional cooperation via trade and commerce (Sandra et al., 2014). The socio-economic benefits of public procurement highly depend on the matter that how public procurement is managed and controlled? Public funds are scarce and governments must invest with intention. Considering the facts, public procurement systems should be based on the principles of economy, transparency, and the value of money, it is essential to reinforce the conceptions of public procurement through legislation, regulations, and capacity building at individual and institutional levels (Darnall et al., 2018). Therefore, public procurement stands on four pillars as follows:



Source: (Khan, N. 2018)

Fig.1. Pillars of Public Procurement

To bring efficiency in the public procurement process, certain guiding principles must be observed like the value of money, economy, transparency, quality of goods & services, and fair competition, without which efficient procurement process will remain questionable. Pakistan is ranked 124 in corruption among 180 countries of the world (Corruption Perception Index, 2020). The major source of corruption was found in public procurement and public contract management. The loopholes in public procurement rules may lead towards cartels among vendors to take price advantage and provide an opportunity for corrupt practices. Huge expenditures and the quantum of procurement have evolved the opportunity of malpractices, waste of public funds, and other transparency-related issues. For such expenditure, there is a need for transparency and non-discriminatory actions and legislation. In the public procurement system, transparency and accountability essentially cover important aspects of the procurement process. It needs a supporting environment, established framework, administration capacity, and statutory framework.

In addition to transparency, the economy is also an important measure to achieve efficiency in public procurement. Every procurement has its own cost to incur from initiation to completion that includes transaction cost (usual course of action of procurement) and non-transaction cost (unusual course of action). Transaction cost is incurred by both the procuring agency and the bidder (cost of the bidder ultimately becomes the price of the procurement). Non-transaction cost is an unusual cost/suspicious cost of the procurement e.g. bribery, retendering and pandemic situations, etc. Moreover, to achieve efficiency and level of the economy, public procurement is advertised in newspapers if it exceeds specific financial limits authorized by procurement regulatory authorities. The main aim of the advertisements is to spread wide information to all bidders, hence ensuring a wide range of competition among bidders to use public funds transparently and efficiently.

Presently, newspapers have become costly mediums of advertisement (OECD, 2017). In most developed countries, the use of ICT has replaced this mode of advertisement (Hawkins, 2011). In some developing countries, the financial cost of an advertisement in newspapers is very high, following the size and contents of the advertisement (Asif & Nisar, 2018). Government has to expend extensive funds on advertisements of the tender which can be cut down by captivating some sensible resolutions. Following higher the procurement cost lesser would be the economy, Pavel (2007) created a taxonomy of the main types of transaction costs connected with public procurement (table 1).

Table 1: Taxonomy of Transaction Costs Connected with Public Procurement

Time Dimensions Sector	Ex-ante	On-going	Ex-post
Public	<ul style="list-style-type: none"> • Preparation of the tender documents • Administration of the tender preparation • Fees of external experts • Legal costs 	<ul style="list-style-type: none"> • Administration of successive tender 	<ul style="list-style-type: none"> • Re-start of annulled procedure • Contract amendments costs • Cancellation or delay cost • Procedures costs • Legal costs
Private	<ul style="list-style-type: none"> • Bidding Cost • Qualification Cost • Guarantees 	<ul style="list-style-type: none"> • Communication with tender 	<ul style="list-style-type: none"> • Contact amendments costs • Cancellation or delay cost • Legal cost

Source: Pavel (2007, 2013).

So, public procurement must be efficient if it has to ensure economy and transparency. In this regard, annual procurement planning, use of information and communication technologies (ICT), capacity building of employees, and a strong redressal system may assist public procurement efficiency leading to economy and transparency in the procurement process.

I.I Public Procurement in Punjab, Pakistan

Before going through the details of the public procurement process, it is important to understand the legislative system of public procurement of Punjab. The legislative system of Pakistan contains the Constitution of 1973. This Constitution does not directly deal with public procurement, further

no federal or provincial laws are directed to regulate public procurement. However, the public procurement regime in Pakistan is dealt with by the subsidiary legal and regulatory framework. By far, the public procurement of Pakistan has gone through different stages to reach its current shape:

- a. First, the purchase manual covers the commodity purchase of nine categories purchased by foreign-funded projects. There are many flaws in the purchase manual instead of currently applicable procurement rules (Purchase Manual, 1947).
- b. Second, infrastructure developments and the hiring of experts are governed by the West Pakistan Building & Roads Department Code (West Pakistan B&R, 1960)
- c. In 1951, the most important are General Financial Rules (GFR) containing procurement rules and subsequently revised in 1979 by the Federal government, and the delegation of financial power rules is also involved up to some extent.

In these legislations, there was no clear monitoring framework for detecting the miss-procurements done by the practitioners of the public procurement. Moreover, there was no unique system that provides a platform to resolve the grievances concerning procurement transactions. The former procurement regime was replaced in 2002 through a Presidential Ordinance with the implementation of the Public Procurement Regulatory Authority (PPRA) at the federal level. Public Procurement Rules, 2004 & Public Procurement Regulations, 2008 further strengthen this system. After the 18th Amendment in the Constitution of Pakistan (devolution of power at the provincial level), public procurement has become a provincial chapter. Punjab has espoused the PPRA system in 2007 which under the same taxonomy was converted into an Act in 2009. In the same year, Punjab Procurement Rules 2009 were notified to strengthen the procurement system in the province. To avoid the problems in the existing procurement system and to bring efficiency, transparency, value for money, fair competition, accountability, and good governance, a new procurement system was transported by publicizing PPRA Act and Rules 2014 in Punjab. The new system responds by the best international practices. This was an effort to create standardization in the procurement system at the federal and provincial levels.

The former procurement regulatory framework is a victim of the slow mechanisms of dispute resolution partly because of the weaknesses found in the judicial system and partly due to the complex procedures for appeals. The recovery mechanism of malpractice or default is also very cumbersome because insurance bonds are infrequently cashed. Contractors also face prolonged

legal fights in recovering their sums from the government. Further, overall flaws in the jurisdictional system are other issues that could be handled by the establishment of a fast-track procedure mechanism.

Concluding, an efficient procurement system is simple and transparent that produces positive outcomes without prolonged intervals. In addition, efficiency entails pragmatism, in terms of compatibility with the administrative resources and professionalism of government organizations. Keeping in view the ongoing discussion, the aim of this study rests to identify the factors that endure the efficiency of public procurement in Punjab, Pakistan. For this purpose, the public procurement rules of Punjab 2014 are investigated in detail. Efficiency in public procurement is measured through economy and transparency. This study is novel and provides roots to further studies in this area. This study is a healthy contribution to the existing literature.

The current section provides a brief introduction of procurement practices and processes that have been discussed. Further, this article has four more sections, section 2 highlights the pertinent studies from standing literature to comprehend the gap of the study. Section 3 defines the research design and methodology to be incorporated. Finally, section 4 explains the major findings with limitations. In the end, section 5 provides a conclusion and implications to bring transparency and economy in the procurement process.

II. LITERATURE REVIEW

Being the major portion of government expenditure, transparency and efficiency in public procurement have become the basic need of growing economies. Efficiency in government public procurement results not only to save financial resources but to reposition them to most anticipated projects as well. Therefore, transparency in public programs helps to bring sustainability to the economy. In this regard, Choi, (2006) describes the public procurement program as an attractive motivation for profit-seekers investors. Therefore, public procurement processes need to be effective to support government actions (Wittig, 1999). Witting (1999) further asserts that the private corporate sector is also managing to advance its procurement system so that the procurement activities help them to provide rapid response following changing market environment.

Procurement efficiency refers to the strategies that how public organizations allocate public funds to procure goods and services (Hall, 2009). Procurement efficiency is considered as the mainstay

of a firm's success as it contributes to economical purchases and the attainment of quality goods. However, low performance by procurement process entails financial loss caused by poor-quality materials, and inflated prices thus contributing to reducing profitability (Juma, 2010). Therefore, public procurement is repeatedly directed by the principles of accountability, transparency, and achieving value for money.

Following existing literature, public procurement has been a deserted area in the field of public finance because of its administrative nature. Since the pioneering work in this regard has elaborated the importance and feature of public procurement. In this regard, Thai (2008), Burt et al., (2009), and Monczka et al., (2008), in their papers elaborate on the broad features of public procurement. While, many others highlight the principal issues of procurement (Acrkerman, 1999; Soreide, 2002), socially responsible purchasing practices (Carter, 2000), public procurement as a social liability (Fox et al., 2002), the influence of procurement on R&D (Cohen et al., 2002; Eadler & Georg, 2007), procurement by e-Government (Bhatnagar, 2003), green purchasing (Beste, 2008), and power of high-level bureaucracy (Baily et al., 2005).

Further, researchers from the modern era have tried to focus on the role of information and communication technologies (ICT) while assessing outcomes from the public procurement system. Before the introduction of e-procurement, strategic procurement was often handled as a routine task that involves individual transactions (Prier & McCue 2007). Thomas & Rainer (2005) point out that procurement systems in the past have long been maintained by ICT leading towards reduced transaction costs and information asymmetry. Many modern researchers argue that an e-procurement system is a perfect alternative to reduce transaction costs (Sambasivan et al. 2010; Suki & Ramayah 2010; Fernandes & Viera 2015; Prier & McCue 2007). Sicakova-Beblava et al., (2011) argue that the e-tendering process tends to minimize associated transaction costs, enhances transparency, and improves outcomes. According to Arrowsmith & Trybus, (2003) many governments are now cognizant that the significant savings in cost can be gained by managing a well-managed procurement process system. Further, internet technologies have facilitated faster and efficient procurement operational activities enabling managers to concentrate only on the level of strategic tasks (Suki & Ramayah 2010).

Now, the increased attention towards procurement issues appreciated that a well-organized procurement system leads to better governance. Therefore, developed economies have gone through many procurement reforms while developing countries are also trying to adopt best

procurement practices to achieve transparency and economy to enhance the accountability of public bodies. According to Victor (2012), procurement expenditures could be minimized through the proper implementation of procurement performance practices. A relatively well-developed body of research by Daniel, (2010), Victor, (2012), and Tom, (2009) explore the implementation of procurement practices in public sector organizations. Njeru, (2015) examine the factors affecting effective implementation of procurement practices in government parastatals, in general, and left a major knowledge gap on determinants of procurement efficiency in government parastatals. It is hence against this background this study was undertaken to examine the determinants of procurement efficiency in government parastatals in Kenya.

It has been detected in the existing literature that the conventional procurement processes following in developing countries obstruct project success (Frimpong et al., 2003). So, further research is mandatory in developing countries at the individual level such as procurement (Ofori, 1993). As Ofori (1993) suggests it is the catastrophe of the research commenced so far to explain the body of knowledge to identify the factor for reduced performance in public procurement of developing countries. So far, many other issues have been undertaken in the literature investigating developed countries leaving a gap to conduct the same issue in developing economies. For example, to explore the impact of the external and internal indicators on the procurement practices in developing economies. While many authors have deliberated the impact of public buying in many interrelated areas, scarce research is accessible on the extensive spectrum about the role of public purchasing in savings public funds. As far as the efficiency in the public procurement system is concerned, previous researches has provided little evidence on the issue specifically for Pakistan. Therefore, the present study tries to fill this research gap by providing an empirical base on the issue of efficiency in public procurement through transparency and economy.

III. CONCEPTUAL METHODOLOGY

The present research is explanatory following the measurement and selection of variables. The data for this research is collected through a self-administered questionnaire. The present research is quantitative and relates to measuring the association between study variables. The data is a cross-section in nature. For achieving the research objectives, the primary source of data collection is used. The data collection is very important due to the cause-and-effect relationship of certain variables. A comprehensive self-administered questionnaire is framed to obtain an opinion from

the respondents about their views regarding the factors that impact the efficiencies in public procurement.

The present study aims to highlight the important factors that affect efficiencies in public procurement, primary information from experts/executives and their corresponding staff (respondents) working in procurement sections of public sector organizations have been collected. The reliability analysis of the questionnaire shows that the overall value of Cronbach's Alpha is 0.694 (table 2). Further, the item-wise value of the Cronbach's Alpha is also given to show that each item is found to be reliable to proceed with the study.

Table 2: Reliability Statistics

Variables	Cronbach's Alpha	No. of Items
Overall	0.694	52
Efficiency (EFF)	0.642	07
Capacity Building (CAB)	0.799	10
Strong Redressal System (SRS)	0.683	10
Use of ICT (ICT)	0.737	12
Procurement Planning (PP)	0.634	08
Tender Advertisement (TAD)	0.645	05

The study aims to extract out the determinants that may bring efficiency in public procurement. Thus, the efficiency is measured through economy and transparency; while the explanatory variables i.e. capacity building, redressal system, use of ICT, procurement planning, and tender advertisement limit are employed to measure economy and transparency in the procurement system. As far as the variable of capacity building (CAB) is concerned, it is expected to have a positive relationship with efficiency. More training and development programs available to the human resource may lead towards effective implementation of the procurement rules. Hence, CAB may ensure transparency and economy in the procurement process positively which leads towards overall procurement efficiency.

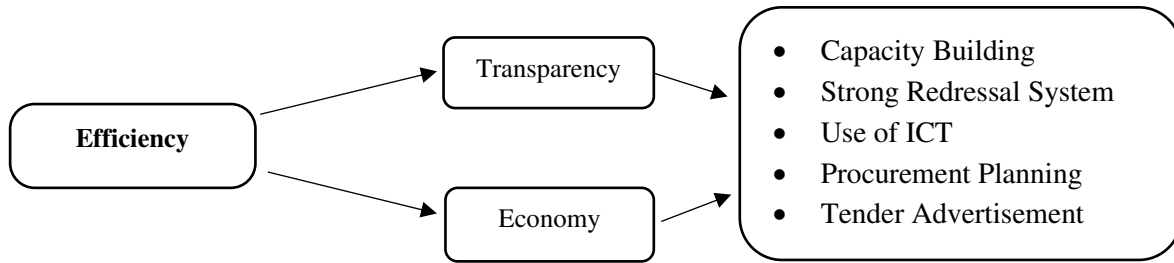


Fig. 2: Conceptual Framework

The access to the Strong redressal system where contractors/bidders can submit their reservations can lead towards a healthy environment and competition among bidders which in turn leads to transparency and economy in the procurement process positively. Further, the use of information and communication technologies (ICT) enhances and controls corrupt practices by minimizing information asymmetries among prospective bidders. Further, the use of ICT can also be employed to replace the drawbacks arising out of the manual procurement process. Therefore, the use of ICT acts to have a positive impact on transparency and the economy in the procurement process.

As far as the procurement planning (PP) is concerned, PPRA rules bound procuring agencies to have annual procurement planning since the inception of the financial year duly uploaded on their websites. To spread wide information among the potential bidders and also to provide an opportunity to the procuring agency to manage procurement in a better way rather than the abrupt procurement decisions. This may lead towards a reduction in cost as well as the element of corruption in the procurement process. So, proper and timely procurement planning suggests having a positive linkage with transparency and economy in the procurement process leading towards efficiency.

Last but not the least, PPRA rule regarding the tender advertisement limit says that any procurement above Rs. 5 million must be published in any two newspapers (one in Urdu and the other in English) circulated within the region/province. Now, to publish tender notice of more than Rs. 5 million, the procuring agency has to advertise its tender as per PPRA rule which added cost into its financial burden so, this limit should be enhanced. In this way, the advertisement cost should be reduced by enhancing the limits leading towards the economy in the procurement process. Further, the PPRA rule for advertisement limit can be misused by procuring agencies by publishing tender in the non-reputed newspapers not widely circulated in the region. This factor

may hinder the best procurement practices and leads to unhealthy competition among bidders threatening procurement transparency. So, enhancement in the limit of public tender notices can lead towards transparency and economy in the procurement process.

The impact of certain demographic variables such as age, gender, qualification, and income level, etc. is also analyzed to make it comparable. To draw the relationship among variables, the regression model is employed. The model is as under:

$$\text{Efficiency} = \alpha_0 + \beta_1 \text{CAB} + \beta_2 \text{SRS} + \beta_3 \text{ICT} + \beta_4 \text{PP} + \beta_5 \text{TAD} + e$$

Efficiency= the efficiency of the procurement process

CAB= capacity building

SRS= strong redressal system

ICT= use of ICT

PP= procurement planning

TAD=tender advertisement

e= white noise error term

Based on literature review and conceptual methodology, the following null hypothesis can be tested:

H₀₁: The capacity building does not impact the efficiency of the procurement process

H₀₂: The strong redressal system does not impact the efficiency of the procurement process

H₀₃: The use of ICT does not impact the efficiency of the procurement process

H₀₄: The procurement planning does not impact the efficiency of the procurement process

H₀₅: The tender advertisement does not impact the efficiency of the procurement process

IV. EMPIRICAL DISCUSSIONS

This section provides the empirical analysis and justifications of obtained results. The data has been collected from the Punjab region, and a total of 450 questionnaires had been distributed to the targeted respondents for analysis. Out of the total distributed questionnaire, 325 responses had

been received. Therefore, the response rate for the current study is 75% (325/450) which is considered adequate to proceed with further data analysis.

IV.I. DEMOGRAPHIC ANALYSIS

To analyze the demographic statistics of the selected respondents, the descriptive statistic has been applied with the help of frequency distribution. The main demographic characteristics of the respondents include gender, age, qualification, income level, and designation of the experts & staff working in procurement sections of government institutions. Table 3 shows the descriptive statistic of demographic variables.

It is clear from the obtained outcomes that there are 279 (279/325=86%) male respondents and the remaining 46 (14%) are females. It means that the majority of the respondents belong to the male category while in Pakistan females are not very keen to opt for this type of job. Therefore, maybe the involvement of female respondents is very low as compared to the male.

Further, the demographic statistic for qualification variables narrates that the majority of the respondents belong to master degree holders (65%) while 23% of the respondents are graduates. Similarly, 74% of the respondents are of middle-level management while 14% belong to top-level management. Further, the statistic for the income level of the experts shows that 70% of the respondents took 50,000 to 100,000 salary packages. Further, 50% of the respondents belong to the age category of 30-40 years.

Table 3: Demographic Statistic

Description	No.	Frequency
<u>Gender:</u>		
Male	279	86%
Female	46	14%
Total	325	100%
<u>Qualification:</u>		
Intermediate	40	12%
Bachelor	75	23%
Masters & Above	210	65%
Total	325	100%
<u>Designation:</u>		
Top Level Management	45	14%
Middle-Level Management	240	74%
Lower Middle Management	40	12%
Total	325	100%

<u>Income Level:</u>		
50,000-100,000	229	70%
100,001-200,000	56	17%
200,001-300,000	34	11%
300,000 and above	6	2%
Total	325	100%
<u>Age</u>		
Below 30	91	28%
30-40	162	50%
40-50	62	19%
50 & above	10	3%
Total	325	100%

IV.II. CORRELATION ANALYSIS

Pearson's correlation has been applied to find the association between procurement efficiency and other selected variables. Correlation analysis provides the basics to measure the degree of association among the variables (Sekaran & Bougie, 2009). Pearson's r correlation is the best measure to find the direction and strength of the relationship between variables. The results of Pearson's correlation have been given in table 4.

Table 4: Correlations Analysis

		Mean	SD	EFF	CAP	SRS	ICT	PP	TAD
EFF	Efficiency	4.25	1.52	1					
CAP	Capacity Building	4.15	0.93	0.32*	1				
SRS	Strong Redressal System	4.03	0.85	0.45**	0.44*	1			
ICT	Use of ICT	4.32	1.43	0.31**	.082*	0.20*	1		
PP	Procurement Planning	4.43	0.56	0.45**	.096*	0.38*	0.56	1	
TAD	Tender Advertisement	3.93	0.95	0.36**	.45**	0.17	0.19	0.25*	1
N=325									

As far as the validity of the items is concerned, it is assumed that if correlations values are significant then items are valid to conduct the study. From estimated outcomes, it is clear that all variables are valid while checking their correlation with the efficiency in public procurement. It is clear from the table results that all of the selected variables are associated with procurement efficiency. It means that capacity building, a strong redressal system, use of ICT, procurement planning, and tender advertisement play important roles in determining the efficiency of the procurement process.

Table 5 explains the goodness of fit of the model. While R-square displays the %age of variations in explained variable due to the explanatory variables. The value of R-square ranges between 0 and 1. The higher value shows a stronger influence of the explanatory variable on the explained variable. DW explains the existence of the autocorrelation issue, the estimated results explain that there is no issue of autocorrelation.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.564	0.566	0.448	1.4562	1.628

The results of the model summary showed that the model is adequate and fit and further analysis can proceed with the same variables. Further, the R-squared is “0.566” and Adjusted R-squared is “0.448” with S.E. of regression of “1.4562”, indicating this model estimates 56% variations with 1.4562% standard error of the estimate. The outcome from the regression analysis is given in table 6.

Table 6: Regression Outcomes

Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	26.26	17.443	0.774	1.505	0.044
CAP	1.022	0.715	0.656	14.293	0.006
SRS	2.264	0.454	0.994	4.984	0.009
ICT	0.994	0.345	0.663	2.881	0.046
PP	0.364	0.699	0.363	0.520	0.032
TAD	0.569	0.456	0.425	1.247	0.054
a) Predictors: Constant (C), Capacity Building (CAP), Strong Redressal System (SRS), Use of ICT (ICT), Procurement Planning (PP), Tender Advertisement (TAD)					
b) Dependent Variable: Procurement Efficiency (EFF)					

The estimated results of the regression analysis have been given in table 6. It is evident from the obtained outcomes that every explanatory variable is significantly linked with the explained variable either at a 5% or 10% significance level. The t-statistic for capacity building (CAP) is “14.293” with a p-value of “0.06”, which indicated that this variable is “significant” because the test statistic is greater than the table value and the p-value is lesser than 0.05. So, the alternative

hypothesis is accepted, based on the p-value. It means that capacity building is an important indicator to determine the efficiency of the procurement process. Public procurement is a very dynamic field, the staff is trained about the legislative requirement & procedures, an expert in the use of technologies, having better communication & negotiations skills and supply chain management, etc. Thus, the capacity building plays an important role at the individual level. The well conversant and trained human resources may ensure efficiencies in public procurement. The results explain that 1% change in CAP, 1.022% change has occurred in procurement efficiency.

The t-statistic for the strong redressal system (SRS) is found to be “4.984” with a p-value of “0.009”, further indicating this variable as statistically “significant” for determining the efficiency of the public procurement process because test statistic is greater than table value and the p-value is lesser than 0.05. Based on these results, the alternative hypothesis is accepted. It can be justified that the formation of a redressal committee, strong monitoring, and accountability of the redressal system play important role in achieving efficiencies in the public procurement process. Well managed redressal system provides a democratic opportunity to the bidders to highlight their issues and reservation before redressal committees. In this way, strong redressal mechanism procurement not only helps to ensure transparency but also ensures the economy in public procurement. The results explain that 1% change in SRS, 2.262% change has occurred in procurement efficiency.

The t-statistic for the use of information and communication technologies (ICT) is “2.881” with a p-value of “0.046”, indicating this variable as “significant” because the test statistic is greater than the table value and the p-value is lesser than 0.05. So, the null hypothesis cannot be accepted, based on the p-value and we can accept the alternative hypothesis. Thus, explains that the use of information and communication technologies (ICT) or the use of e-resources for information spreading instead of the use of newspapers play important role in achieving efficiencies. As by the use of ICT, any bidder anytime and at any place can participate in the tender and this factor can also reduce the information asymmetry among bidders. Further, the use of ICT also ensures the transparency of the procurement process which ultimately leads to the efficiency of the procurement system. Based on the literature, it is evident that other avenues like social and digital media may also be used to spread tender information among prospective bidders. The results explain that 1% change in ICT, 0.994% change has occurred in procurement efficiency.

The t-statistic for the procurement planning (PP) is “0.520” with a p-value of “0.032”, is indicating this variable is significant at 5% because the test statistic is greater than the table value and the p-

value is lesser than 0.05. The alternative hypothesis is accepted on basis of the p-value which means that appropriate procurement planning is an imperative tool to reach efficiencies of the procurement process. Preparation of annual procurement and uploading on PPRA web thereon assist procuring to plan procurement in better instead of abrupt buying policy. Moreover, it also facilitates getting attractive bids by reducing the inflation risk. On the other side, the annual procurement plan also provides an opportunity for the supplier to plan the coming procurement by locking the price rate from authorized distributors or the manufacturers. Simply, it means that uploading the annual procurement plan on the PPRA web page and monitoring the procurement plan can bring efficiencies in the procurement process. The results explain that 1% change in PP, 0.364% change has occurred in procurement efficiency.

The t-statistic for the tender advertisement (TAD) is “1.247” with a p-value of “0.054”, signifying this variable as “significant” at 10% because the test statistic is lesser than the table value and p-value is greater than 0.05. The alternative hypothesis defines that the relationship exists between tender advertisement and procurement effectiveness. The results support that the value of tender advertisement must be enhanced and the size of the tender advertisement in the newspapers must be carefully monitored to reduce the tender advertisement cost. Therefore, the size of the tender advertisement must be minimized to display specific information to make the advertisement cost-effective. Further, the details of the tender if cannot be given completely in the newspapers, though ICT can be used effectively for spreading tender information to bidders rather using print media. The results explain that 1% change in TAD, 0.569% change has occurred in procurement efficiency.

V. CONCLUSIONS

Procurement efficiency management represents the process of planning, executing, appraising, and controlling the tactical and operational purchase decisions. It also directs all activities of purchasing function toward the attainment of long-term goals and conveying economically comprehensive resolutions to attain value for money (Eyaa & Oluka, 2011). The present study investigates that how to bring efficiencies in the procurement system of Punjab by addressing shortcomings in PPRA rules. The corrective measures in procurement rules and strong policies at the level of procuring agencies can help to achieve procurement efficiencies. The empirical analysis is based on a survey of over 325 experts working in procurement departments from Punjab. This data was sought for the first time to directly assess the efficiency of procurement.

The present study is unique in the sense that it explored a topic that is very sensitive and important for the procuring agencies and especially for the government. Procurement is one that not only brings economies into the entire procurement process but also enhances effective control over malpractices and corrupt activities. In Pakistan, a lack of ownership of public funds leads to diseconomies in the procurement process. Moreover, the recent threat of accountability, the bureaucracy, and public executive reluctance to be engaged in the procurement process increases the time and cost of the procurement. Moreover, the nexus between contracts, cartels, monopolies, tunneling of procurement rules, and ill intentions of procurement staff lead to inefficient procurement. So, this paper has helped the procuring agencies to bring efficiencies in the procurement system through economies and transparency.

It is also observed that the procuring agencies can achieve economy of scale and transparency in their procurement system and the reported explanatory variables have a positive impact on the procurement efficiency. Hence, through efficiency in the procurement system, the control and evaluation system can be enhanced and the procuring agencies can save significant public money which can be utilized by other deprived sectors. Transparency and economy mainly can be enhanced by the use of the e-procurement system as evident in many sectoral IT reforms introduced by the govt. of Punjab such as an online land record system, Punjab safe city, and e-licensing system, etc. From the obtained results, a few recommendations are being presented to the procuring agencies and the government to improve procurement efficiencies as follows:

- The role of ICT is very important to bring efficiencies in the procurement system. PPRA needs massive reforms to implement an e-procurement system. Bureaucratic hurdles in implementing an e-procurement system should be addressed vigilantly. Procuring agencies must provide training and resources to implement an e-procurement system. However, the use of other advanced technologies may also be encouraged to ensure healthy competition. In this regard, the government should bring legislative reforms in PPRA regulations, where necessary.
- Well-designed and managed capacity-building programs should regularly be launched by PPRA for procuring agencies and bidders. Procuring agencies should also be encouraged to launch in-house capacity-building programs. In this connection, the national institute of procurement (NIP) is one of the concrete steps. Moreover, workshops and conferences should also be encouraged for enriching the knowledge of HR.

- Tender publicity through newspapers is the costly medium of advertisement. It is proposed that the tender information should be spread through the use of e-resources which are fast and cost-effective mediums. Further, the use of other digital mediums like social media and mobile technology should also be beneficial for spreading tender information.
- Annual procurement planning is only assisting the procuring agencies to carry out the procurement in an organized and gifted manner but also providing an opportunity to the vendors to explore the local and international markets for the best competitive rates in advance. It is suggested that PPRA should closely monitor that the procuring agencies uploaded the annual procurement plans on its website and in case of failure the procuring agencies should be penalized.
- Finally, adopting a strong redressal mechanism (redressal committees) enables procuring agencies to identify the loopholes in the procurement process. It provides a platform for addressing the grievances of the bidders. Most importantly, a strong redressal mechanism serves as well against corrupt practices in the procurement system. It is highly viable for procuring agencies to establish independent and high-power redressal committees to address the issue, queries, and objections of the bidders and also serve as fear of accountability for procurement executives.

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