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Factor analysis study on the antecedents to stakeholder's concern in PPP projects in Punjab

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ABSTRACT

The research reflects on the prevalence of stakeholder's anxieties in the PPP infrastructure based projects in Punjab. The intention is to analyze stakeholder's concerns (stakeholders identify as execution authority that needs to coordinate with public and government agencies as well as general user of infrastructure). This objective has been worked out from stakeholder's perspectives. The focus is on the professional and the work related concerns that might affect the working of public and private sector arrangements. The data was collected from 103 managers associated with the infrastructure projects being run in PPP mode in Punjab state. The factor based extractive analysis is the first step towards the selection of items that truly represent the factors assumed for study. The study observed that perceptions of investment climate and technical feasibility matters most to participating managers. The SEM modeling yielded that stakeholder's concern while PPP execution is genuine. The "concerns" are rather rooted across contextual aspects and are shaped by their perceptions of system, the perceptions of skills as well as aspects of investment climate and public support. In terms of factors "lack of skills" was observed as exerting maximum possible pressure on the riskiness and shaping of concerns. In continuity, the stakeholders perceive "governance" issues as next potential aspect that fuels stakeholder's worries and anxieties. In relative association, the factor "legal constraints" were observed to fuel stakeholder's concerns respectively.

1. Introduction

Globally, the need for sustainable investments in economic infrastructure is experiencing a rise. Especially across the emerging and developing economies, the population based pressures on scarce economic resources, influx of migrants from rural areas, increasing per capita incomes and ongoing urbanization; are bound to create fresh demand for new economic infrastructure in terms of schools, colleges, health care centers, roads and railways, power and telecom, water and sewerage systems as well as transportation mechanisms. Not only this, the existing economic infrastructure is either ageing, requires maintenance or expansion on account of rise in volume that an existing infrastructure system can handle. The massive infrastructure investments are not easy to mobilize alone by the government agencies and public finances. In India alone, the gap between prospective demand and current rate of investment in infrastructure across various sectors is more than 608 thousand crore.

The "PPP mindset" could otherwise play a vital role in decreasing this gap between the prospective demand and current rate of investment in infrastructure across various sectors. Such experiments

Involving public sector and private sector based partnerships often bring together the two parties with their strengths in order to execute the project in select deadline. "Private sector" as expected undertakes the designing, building, controlling and operating the installed infrastructure whereas the "Public Sector" oversees the execution, monitors the standards, pace of work and the respective operations. The "private sector" is more recognized for skill mobilization, competency development, capability management, resource application, financial management and fast forward access to formal credit and equity markets. The prior experiences, prior learning and expertise across private sector based firms and establishments essentially bring in new business models and better and effective way of operating the newly constructed infrastructure. These insights not only lead to realization of planned break evens but also act as consistent revenue generator for public exchequer. Yet success in PPP models or public private partnerships relies solely on the understanding and sharing, coordination and mutual development of goals and objectives. Private sector as stakeholder has its own set of concerns that might derail the coordination. Amidst these contrasts, this research reflects on the stakeholder's concern in PPP setup.

2. Research Objective

Objective: To analyze stakeholder's concerns with regard to implementation of PPP projects in Punjab

The intention is to analyze stakeholder's concerns (stakeholders identify as execution authority that needs to coordinate with public and government agencies as well as general user of infrastructure). This objective has been worked out from stakeholder's perspectives. The focus is on the professional and the work related concerns that might affect the working of public and private sector arrangements.

3. Literature

A research (Osei, 2017) observed the incidence of the stakeholder's perceptions about working with public sector and that the critical success factors were identified as legal dispute resolution mechanism, service delivery, timely rectification of reported operational problems, stakeholder consultation, streamlining of approval process and effective changes of shareholdings in private consortium. The study across Ghanaian project managers revealed that mindsets often clash and the public office bearer's mindset for private sector participation needs change and review.

Another academic study (Gan, 2015) observed and reviewed the stakeholder's concerns as related with sustainability of the project construction and operations. The study observed that sustainability is promoted when stakeholder's concerns are duly addressed by public sector bodies and corrective actions with regard to resource allocation are taken in timely manner. Another research pointed towards the need (Gohary, 2006) of stakeholder involvement in order to public private infrastructure projects to evade cost escalation and meet pre-determined time lines.

A study (Klinjn, 2008) across 32 managers in 18 complex public private projects underlined the crucial role of managerial choices in terms of strategic orientation, management style, interaction with parties, process dynamics and concerns while implementing in dual leadership. The study further noted that the decision making process for the stakeholders should incorporate the open ended and inclusive approach with focus on diversity and fairness. The study observed that managerial commitment, vertical relationships, goal orientation and coordination emphasis as well as two way communications; could open more prospects for addressing stakeholder's worries than anything else.

Stakeholder's concerns(Wai, 2013) are not only across the visible decision making yet have been observed to possess serious consequences for the manner in which the user benefit is created and leveraged by the end user. In fact the dominant literature (Buelens, 2007) on the subject matter explores the impact of differences across public and private mindsets as influencing stakeholder's sustainable involvement and result co-creation.

The public private partnerships hence foresee the enormous potential of delivering (Patibandha, 2018) large infrastructure improvements yet the public and private sector mindsets differ substantially. The transition of project concept into project based operations; is not an easy task. Across the project life cycle (Ahmad, 2014), several roadblocks have been reported across the literature. A host of existing literature (Ahmad, 2014) points to the fact that consistent conceptualization and seamless management of projects in "infrastructure sector" is not an easy task at all. Rather the mindsets reportedly differ across public and private sector employees.

The employee based sense of satisfaction (Minassian, 2004), is one aspect of project based timely completion yet literature also acknowledges the stakeholder engagement (Delgauuw, 2008) and user's engagement (Gidman, 1995) as other vital concerns. The bureaucratic mentality across public sector employees (Hall, 1999) could possibly clash with "execution mindset" across private sector employees. Amidst these two extremes, the public private partnership has to rest. The literature (Delgauuw, 2008) on differences in motivations also underlines the perceptions of private sector as interested in profit maximization whereas public sector as interested in minimization of input cost. For the successful implementation of infrastructure projects, contrasting mindsets have to overcome the differences and explore the scope for common ground that binds them together.

The dominant literature (Gidman, 1995) on the subject matter reports instances of "extensive differences" of opinions across public and private sectors leading to deadlocks or collapse of mechanisms for timely completion of PPP in developing economies worldwide. A study across World Bank (Minassian, 2004) concluded that ninety percent of "project failure" is attributed to collapse of "coordination" across public and private partners (Gidman, 1995) to the infrastructure projects. The most potential threat has been identified as cost escalation (Lakshmanan, 2008) and failure to deliver value vis a vis the scarce tax payer's money (Patibandha, 2018). The successful and unsuccessful public private partnerships owe a lot to mutual risk management (Hall, 1999) and a progressive mindset (Thipperudrappa, 2017) is required and desired for the PPP model to succeed.

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Stakeholder's anxieties (Amadi, 2014) across public private partnerships (Osman, 2006) have often remained of intense debate and analysis. A host of studies (Henewele, 2013) on the subject emphasizes the stakeholder involvement as crucial aspect. An India specific study (Sehgal, 2019) observed the mechanism as successful until and unless the stakeholders are engaged and involves. The study across 517

respondents revealed that the stakeholder management identifies as one of the most potential aspect of development of infrastructure in economic sector through PPP model. The study leveraged explorative factor analysis to yield a 14 component structure signifying the critical success factors essential for the stakeholders to prosper and grow in PPP environment in India.

A study (Doloi, 2011) linked the stakeholder concerns with delays in the construction projects. The research(Campos, 2018) across Brazilian public private partnership based infrastructure projects revealed that the micro environment, abilities of parties and macro environment are distinct in shaping the prospects in their own unique manner vis a vis the stakeholder's expectations in dually managed projects. The study observed the incidence of stakeholder's expectations as shaping the impetus for change and transition.

4. Construct Operationalization

The factors representing "Stakeholder's perceptions of PPP" were identified as "Ineffective Governance", "Lack of Skills", "Weakness in Execution", "Weak Legal and Regulatory System", "Technical feasibility", "Investment Climate", "Contrasting Mindset", "Public Support for Project" and "Concern for Project". These dimensions of the construct were classified from review of existing literature on the subject matter.

5. Research Methodology

The optimum choice of the research methodology guides the overall research design and the completion of the research task. In view of the assumed research problem with regard to the concern of achieving competitiveness and differentiation with regard to PPP in Indian perspective, the choice of the research methodology has to zero in on an approach that fits well with the established objectives, the hypothesis and the research questions in our endeavor to seek the answers. The data was collected from 103 managers associated with the infrastructure projects being run in PPP mode in Punjab state. The factor based extractive analysis is the first step towards the selection of items that truly represent the factors assumed for study. The research first checks the data for heterogeneity and then leverages the varimax rotation and oblimin rotation based principal component analysis as a tool to validate the data across the research. The exploratory factor analysis was undertaken to ascertain the sub scale item based sensitivity vis a vis local and contextual operationalization of phenomenon. The factor validity assessment and reliability examination was accomplished with aid of SPSS. The SPSS version release 24.0 was leveraged to analyze the data collected from across likert scales. The validity assessment is essential in order to ascertain the factor structure as well as to establish the construct validity. This is required as the need is for the segregation of the representing sub scale items from the non-representing sub scale items.

6. Data Analysis

With regard to "stakeholder perceptions", the cronbach was observed to be 0.919 which is dominantly in satisfactory range of 0.50 to 0.99. The first important task before the usage of principal component analysis was to ascertain the factorability of the data and the respective ascertainment of the presence of correlation across the sub scale items. Hence KMO Bartlett's test was conducted to figure out the sampling adequacy as well as Bartlett's Test of Sphericity. The measure of sampling adequacy with regard to "stakeholder's perceptions" was observed to be in the satisfactory range of 0.5 to 0.9. KMO measure for the sample (n=103) for the stakeholder's perceptions and concerns was observed to be 0.783 which reflects and points towards presence of substantial adequacy with regard to data hence collected from the likert scale(N=103).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.783
Bartlett's Test of Sphericity	Approx. Chi-Square	3768.135
	Df	1081
	Sig.	.000

Table 0-1: KMO Bartlett's test for sampling adequacy: Stakeholder's Concerns

In terms of scale elements weightage, the stakeholders in projects in PPP mode were observed to be more concerned about the prevailing "investment climates" than anything else. This factor exhibited 24 per cent weightage. This was followed by "technical feasibility" of the project as exhibiting 11 per cent weightage in the scale elements. This was subsequently followed by "contrasting mindsets" as exhibiting next eight per cent weightage. In nutshell, the research outcomes point to substantial stakeholder's concerns with regard to successful implementation of PPP projects in Punjab. The stakeholders when asked to respond on the constituent factors vary substantially with regard to responses and differed significantly in terms of factor weights. The research outcomes hence point towards the valid stakeholder's concerns with regard to implementation of PPP projects in Punjab.

Factor Sub scale statements	Item	1	2	3	4	5	6	7	8	9
Factor: Ineffective Governance										
Time and context of decisions and extent of U-turns with regard to benefit determination and cost liabilities of infrastructure usage	**GOV1**									.801
Interference and intervention by lateral and invisible stakeholders, brokers, mediators	**GOV2**									.777
Uncertain Decision methodology and presence of information asymmetries	**GOV3**									.804

Exposure of project management team to local business conditions, ethics and patterns of conducting business	**GOV5**									.771
Factor: Lack of Skills										
Weak institutionalized capability of expert evaluation panel	**SKI1**					.807				
Lack of convincing accurate project feasibility study	**SKI2**					.804				
Lack of standardization of the tendering process and documents	**SKI4**					.760				
Execution staff lack the necessary coordination skills	**SKI5**					.766				
Coordination mechanism based employees use more discretionary power than the merits of decisions	**SKI6**					.750				
Factor: Weakness in Execution										
Lengthy delay in finalizing negotiations, procurement, execution, land take-over, land use restructuring	**WE1**				.759					
Lack of experience, exposure and appropriate skills in PPP project delivery	**WE2**				.762					
Lengthy delay due to change in governments	**WE3**				.799					
Absence of comprehensive and clear policy guidelines and procedures	**WE4**				.779					
Weak public institutional structure and capacity	**WE5**				.744					
Factor: Technical Feasibility										
Project size is technically manageable by a single consortium	**TE1**		.738							
Possibility of innovative solutions (involving cost saving, time saving)	**TE2**		.852							
Availability of government experience in executing such similar project with private sector	**TE3**		.830							
Service quality can be easily defined and established objectively	**TE4**		.787							
Project is unsusceptible to technological changes and ICT development	**TE6**		.843							
Extent of bankability and security of cash flows	**TE7**		.810							
Factor: Investment Climate										
Extensive discretionary power of public officials and evaluators in decision making	**INCLI1**	.901								
Local protectionism	**INCLI2**	.876								
Governments with large fiscal deficits and debt burden could support PPP mode	**INCLI3**	.848								
Governments with lesser sources of revenue and hard budgetary constraints	**INCLI4**	.785								
Governments with market oriented policies engage in PPP	**INCLI5**	.882								
Demand and purchasing power conditions are essential supports for PPP	**INCLI7**	.876								
Existing conditions of impurity and lack of technology in provision of such goods and services	**INCLI8**	.873								
Factor: Weak legal and regulatory system										
Abuse of invited tendering and direct negotiation	**LE1**						.794			
Lack of an independent effective and efficient tribunal	**LE3**						.859			
Regulatory constraints on market entry	**LE4**						.744			
Protection of investor's rights is at stake	**LE5**						.756			
Appropriate legal framework is required	**LE6**						.861			
Factor: Contrasting Mindsets										
Government officials regard private sector as contractors not partners in process	**CONMIN1**			.826						
Non-cooperation with regard to land use development for lands in vicinity of assumed/undertaken projects	**CONMIN2**			.741						
Unwillingness of public sector bodies to share optimal risk	**CONMIN4**			.784						
Capacity building and capacity strengthening initiatives and support are nominal or missing	**CONMIN5**			.896						
Poor project design and implementation	**CONMIN6**			.867						
Factor: Public Support for Project										

Extent of citizen and local community involvement	**PUS1**								.673	
NGO mobilization for support	**PUS2**								.676	
Involvement of local associations, industry groups, resident welfare organizations in seamless execution	**PUS3**								.880	
Local media involvement	**PUS4**								.754	
Local panchayat or municipal corporation involvement	**PUS5**								.758	
Factor: Concern for Project										
Extent of conflict and coalitions across the stakeholders	**CON3**							.777		
Extent of variations in stakeholder's influence and relationships across project process	**CON4**							.756		
Extent of ability to compromise across stakeholders	**CON6**							.560		
Extent of ability to keep good relationships for achievement of targets	**CON7**							.800		
Extent of coordination as required for smooth conduct	**CON8**							.727		

The table captures the loading and non-loading sub scale items in detail. The criteria was to consider and retain only those sub scale items which load only across the assumed factor as well as exhibit a factor loading in range of 0.5 to 0.9 respective. As evident in the pattern matrices above, the retained loadings within the range 0.5 to 0.99 pointed to respective factor structure. For all the constituent factors, the loading factors were considered for structural equation modeling.

			Estimate	S.E.	C.R.	P	Label
Stakeholder's Concerns	<---	Contrasting Mindsets	.136	.166	.817	.414	par_31
Stakeholder's Concerns	<---	Public Support	.232	.175	1.327	.184	par_32
Stakeholder's Concerns	<---	Technical Feasibility	.122	.166	.732	.464	par_33
Stakeholder's Concerns	<---	Investment Climate	.142	.086	1.638	.101	par_34
Stakeholder's Concerns	<---	Legal Constraints	.275	.116	2.371	.018	par_35
Stakeholder's Concerns	<---	Governance	.436	.156	2.795	.005	par_36
Stakeholder's Concerns	<---	Weakness in Execution	.160	.138	1.165	.244	par_37
Stakeholder's Concerns	<---	Lack of Skills	.458	.141	3.238	.001	par_39

7. Findings

Of these, the factor "contrasting minds" was observed to lead to 0.136 times increase in "stakeholder's concerns" whereas the factor "public support" was observed to lead to 0.232 times increase in concerns. The factor "technical feasibility" was observed to lead to 0.122 times increase in "stakeholder's concerns" whereas the factor "investment climate" was observed to lead to 0.142 times increase in "stakeholder's concerns". In similar aspect, "legal constraints" was observed to lead to 0.275 times increase in subjective "stakeholder concerns". The concerns with regard to "governance" were observed to lead to 0.436 times increase in "stakeholder's concerns" whereas the factor "weakness in execution" was observed to lead to 0.160 times increase in "stakeholder's concerns". The factor "lack of skills" was observed to 0.458 times increase in "stakeholder's concerns" across PPP projects.

This is evident from SEM that stakeholder's concerns across PPP mode of project execution are justified and that factors contributing to phenomenon are justified in understanding the phenomenon across grass roots. The model data fit as achieved in structural equation modeling vindicates that the stakeholder's concerns while PPP execution are not unfair. The concerns are rather rooted across contextual aspects and are shaped by their perceptions of system, the perceptions of skills as well as aspects of investment climate and public support. In terms of factors "lack of skills" was observed as exerting maximum possible pressure on the riskiness and shaping of concerns. In continuity, the stakeholders perceive "governance" issues as next potential aspect that fuels stakeholder's worries and anxieties. In relative association, the factor "legal constraints" were observed to fuel stakeholder's concerns respectively.

8. Implications

The review of stakeholder's perceptions could help the decision maker understand the aspects that could prove detrimental to the overall coordination and management of public and private parties in a PPP arrangement in infrastructure development. The study on the stakeholder's concern could be helpful in the mitigation of risk in possible execution stage.

9. Interest

The author reports no conflict of interest with the government agencies, boars, institutions and the private builders. The study is an expression of self-opinion and no part of the study is either partially or wholly funded by the external agencies, NGOs or the industrial pressure groups.

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