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Analysis Methods for Japanese construction company's Bidding-Strategy

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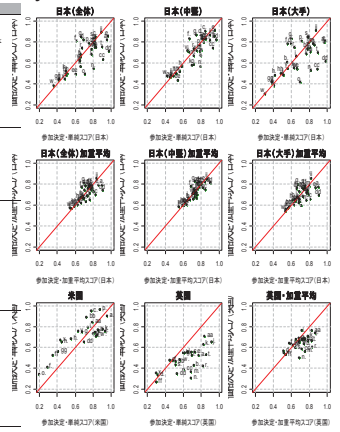
1) 36 factor keywords and an example of the analysis

		日本（2010）	米国（論文1，1988）	英国（論文2，1993）
入札参加の技術的難易度	a.	工事種類	Type of job	Project type
	b.	工事の場所	Location of project	Project location
	c.	工事難易度	Degree of difficulty	Risk involved owing to the nature of the work
	d.	工期	—	Project duration
	e.	工事の規模	Size of job	Project size
	f.	材料・機材費の変動リスク	Type and no. of equipment required/available	Risk in fluctuation in material prices
	g.	設計・積算の完成度	Designer(A/E)/Design quality	Completeness of the documents
	h.	工事の支払い条件	Project cash flow	Project cash flow
	i.	マークアップの確保	Rate of return	Rate of return
	j.	対象工事の魅力	Need for work	Need for work
発注者や発注方法	k.	発注者の評判	Owner	Owner/promoter client identity
	l.	契約の種類	—	Type of contract
	m.	入札方法	—	Tendering. method (selective, open)
	n.	入札の準備期間	Duration	Tendering duration
	o.	入札時期	Time of bidding (season)	—
	p.	設計変更・追加工事等可能性	Degree of hazard	Degree of hazard (safety)
	q.	同種プロジェクトの将来可能性	—	—
競争等の状況	r.	競争相手の数	—	Number of competitors tendering
	s.	競争相手の競争性	Competition	Competitiveness of competitors
	t.	当該工種の過去の実績	Your strength in the industry	Experience in such projects
	u.	過去の経緯（元施工者）	—	—
	v.	現在の市場全体の発注量	Overall economy (availability of work)	—
	w.	現場労働者の雇用条件	Labors environment (union, non-union, cooperative)	Availability of labour
	x.	下請けの仕事の必要性	Portion of work to be subcontracted	Portion subcontracted to nominated subcontractor
	y.	下請け確保の可能性	Reliability of subcontractors	—
	z.	会社の経営状況，財政目標	—	—
自社の受注・状況・他	aa	手持ち工事量	current workload	Current work load
	bb	企業費用見積りの確実性	Uncertainty in the estimate	Reliability of company cost estimate
	cc	資格保有職員のタイプと数	—	Availability of qualified staff
	dd	適切な配置予定技術者の確保可能性	Type and number of supervisory persons required/available	Type and number of supervisory persons available
	ee	応札費用	—	—
	ff	一般管理費等の確保	General overhead	General (office overhead)
	gg	資金調達	Capital requirement/availability	—
	hh	直感・経験	—	—
	ii	発注者積算と自社積算の乖離	—	—
	jj	確率・数学的モデル	—	—



2) An example of the statistical analysis of the bidding data

Dependent Variable:log(predetermined)n=8344
Method:Least Squares

	Standardizing Coefficient β	t	p value		Collinearity-related statistic Tolerance	VIF	Standardizing Coefficient β	t	p value		Collinearity-related statistic Tolerance	VIF
C		10.620	0.0000	***				10.842	0.0000	***		
log(WIN)	0.988	539.941	0.0000	***	0.996	1.004	0.988	540.518	0.0000	***	0.996	1.004
PARTICIPAN	0.048	26.283	0.0000	***	0.998	1.002						
PRE_PARTICIPANTS							0.051	27.966	0.0000	***	0.995	1.005
UNIT×2007	−0.002	−0.844	0.3988		0.994	1.007	0.000	−0.057	0.9547		0.994	1.007
UNIT×2008	−0.003	−1.641	0.1009		0.992	1.008	−0.002	−0.974	0.3301		0.990	1.010
UNIT×2009	−0.004	−2.107	0.0352	**	0.993	1.007	−0.005	−2.680	0.0074	**	0.993	1.007
UNIT×2010	−0.005	−2.811	0.0050	***	0.994	1.006	−0.007	−3.588	0.0003	***	0.993	1.007
R			0.9874						0.9877			
R-squared			0.9749						0.9755			
Adjusted R-squared			0.9749						0.9755			
S.E.of regression			0.0301						0.0296			
Durbin-Watson test			1.5656						1.5755			

3) An example of Multi-Agent Simulation:MAS result

Content:

Public procurement system such as Overall-Evaluation dynamically has been changed on public works in Japan. However some characteristics of Bidding-Strategy and procurement system have not enough clarified.

We analyze the influence that the change of the public procurement system gives to the Bidding-Strategy of the construction company.

1) Question paper survey of Japanese construction company's bidding behaviors : In order to know the consciousness of Japanese construction company's bidding behaviors, a question paper survey is conducted which is similar to three previous experiential study papers of U.S. and U.K. The questionnaires are made to unique to Japanese domestic circumstances. The main questionnaire is the importance evaluation to 36 factor keywords in two situations: one is for the determination of participation in and, another is the price determination (percent markup) for the bid.

2) Monitoring bidding data : In this study, we try to monitoring bidding data between accumulated estimation method and the unit price estimation method. The bidding data were special period. It has two patterns to method of calculating predetermined. As a result, in the case of accumulated estimation method increase participants and decrease win bit rate. The other way around, decrease participants and increase win bit rate. So we make a revolve equation to method of calculating an estimate price and check the effect of the unit price estimation method. We showed that the unit price estimation method has effect of decrease predetermined.

3) Simulation model focused on Biding-Strategy: This study attempt to analysis for a system dynamics and mechanism of Overall-Evaluation by developing new simulation model focused on Biding-Strategy, to propose some improvement scenario.

Keywords : Public procurement, Bidding-Strategy, bidding data

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