The University of Sheffield

Department of Civil & Structural Engineering

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PhD Research: Numerical Modelling of Contract Strategy Evaluation

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I am a PhD research student at The University of Sheffield. The research is an investigation into contract selection for construction projects. I would be very grateful if you could read this document and attempt the exercise. Any information that you supply will be very valuable to the research.

Research Aim of the Exercise:

Is it possible at the beginning of a particular construction project to estimate, **in units of £s and weeks**, the impact that different contract strategies are likely to have on the project's price and duration?

The research defines a contract strategy in terms of three main components:

1. **organisational structure**, i.e. who is responsible for the management, design, construction (e.g. Traditional, Design-Build, Management Contract, etc.);
2. **tender process**, i.e. the type of tender process (e.g. competitive 2-stage, negotiated, etc.) and the basis on which the contract is tendered (e.g. full bill of quantities, drawings and specification, etc.); and
3. **pricing mechanism**, i.e. the method of payment for work carried out under the contract, including reference to whether the price is re-measured or lump sum (e.g. fixed lump sum price, Guaranteed Maximum Price (re-measure) with all costs savings shared equally between client and contractor, cost plus percentage fee, etc.).

What I would like you to carry out

Imagine yourself at the beginning of a project that you have been involved in. Assume you are the client's cost consultant. It is your responsibility to advise the client which contract strategy to select for the project. You must make an assessment of:

1. the client organisation and its relevant capabilities;
2. the proposed project and its circumstances; and
3. the capabilities of potential parties who could be employed under certain contract strategies.

Use this assessment to estimate the following costs and time elements for at least 2 different contract strategies:

- total design duration and design costs paid by the client
- duration of tender process and tender costs paid by the client
- transaction costs (i.e. total costs paid by the client for measuring, monitoring and agreeing a final price)
- construction duration and construction costs **paid by the contractor**
- contractor's mark-up (i.e. the contractor's added amount to cover overheads, profit, risk, etc.)
- the schedule of the main project activities (i.e. design, tender, construction activities)

You are asked to estimate each cost and time element in terms of a minimum, maximum and most likely value to account for the uncertainty in each cost and time element.

Note: It is important **not** to let the actual events of the project influence your estimates. You must try to base your estimates solely upon the information that was available at the beginning of the project when a contract strategy was being selected.

If you have any queries or would like to discuss the research subject please do not hesitate to contact me (Tel: 0114 2225733, Email: cip95sde@sheffield.ac.uk, Fax: 0114 2225700).

Project and Client Description

Could you please provide the following details about the project which you have chosen to consider.

(Note: Do not disclose any information that must, or you would prefer to, remain confidential)

Project Details:

Project Name: _____

Project Type: _____

Approx. date of completion: _____

Project Size: _____

Project Status (e.g. one-off, one of a series, etc.): _____

Site (e.g. green field, already developed, etc.): _____

Location (city centre, remote, etc.): _____

Relative level of project complexity (i.e. High, Med, Low): _____

Brief description of any noteworthy project complexities (e.g. risks, construction constraints, innovative design, etc.):

_____

_____

_____

_____

_____

Client Details:

Client Name/Type: _____

Client's in-house resources: _____

_____

Brief description of client's relevant experience: _____

_____

Relative level of client's quality requirements (i.e. High, Med, Low): _____

Brief description of client's main quality requirements (e.g. functional, aesthetic, serviceable, etc.):

_____

_____

Brief description of the client's flexibility requirements (i.e. is the client's specification for the project complete or does the client wish to/need to make changes at a later stage?):

_____

_____

Contract Strategy 1

Please describe Contract Strategy 1:

Organisational Structure (e.g. Traditional, Design-Build, Management Contract, etc.):

Type of Tender Process (e.g. competitive 2-stage, negotiated, etc.):

Basis of Tender (e.g. full BoQ, drawings and specification, etc.):

Pricing Mechanism (e.g. fixed lump sum price, fixed re-measure price, G.M.P. (re-measure) with cost savings/overruns shared equally)

Major Risk allocation (e.g. client retains risk of unforseen adverse ground conditions)

Any noteworthy details about the potential parties who could be employed under this contract strategy (e.g. designer's or contractor's local knowledge, market knowledge, experience, financial capacity, etc.)?

Please estimate the cost and time elements for Contract Strategy 1 :

Project Element (for definitions see page 1)	COST ESTIMATE (£K)			TIME ESTIMATE (weeks)		
	Min.	Most likely	Max.	Min.	Most likely	Max.
Design						
Tender process						
Transaction costs				N/A	N/A	N/A
Construction						

Contractor's mark-up

Note: if the pricing mechanism is a:

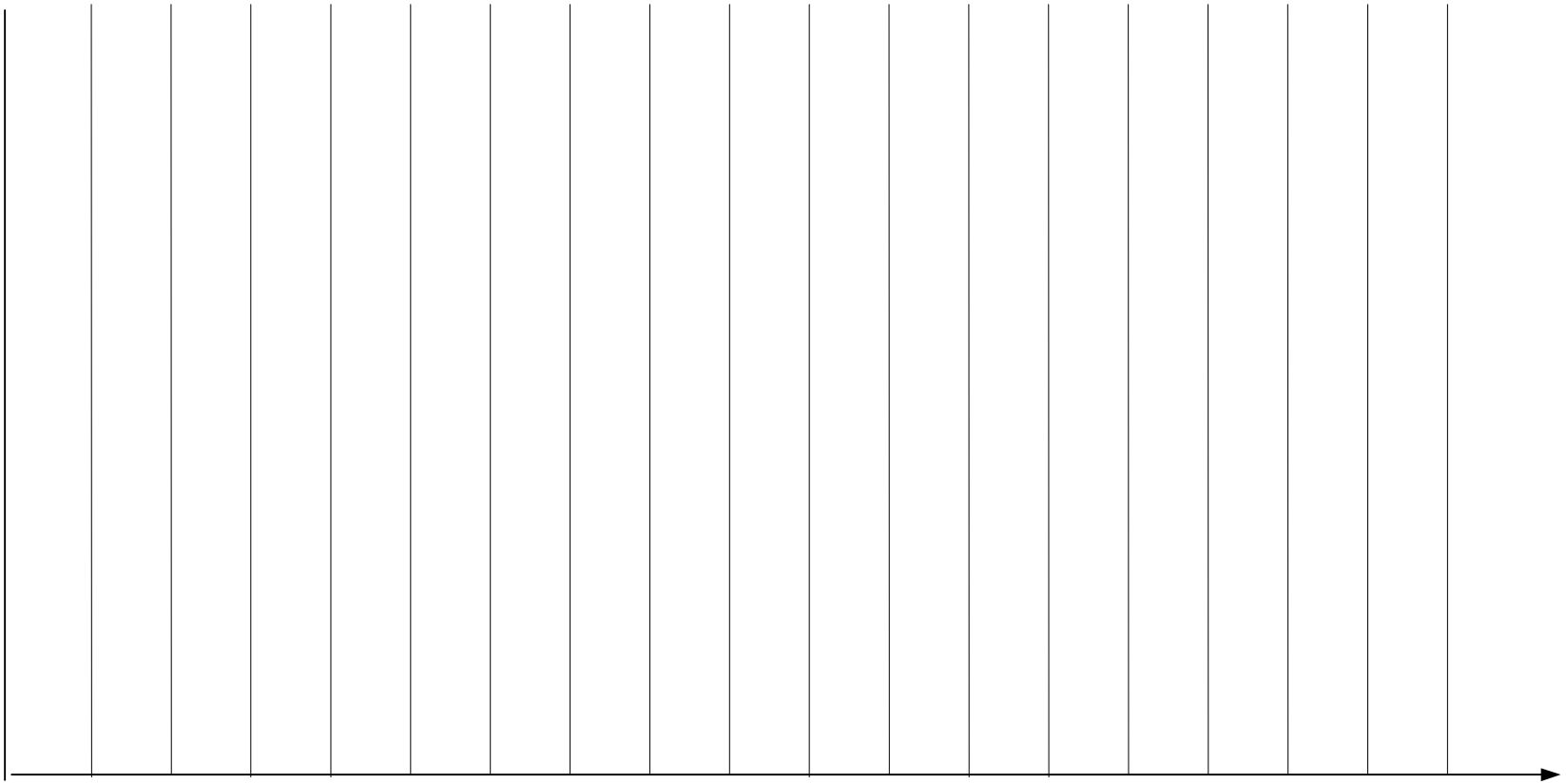
- % fee type please estimate a minimum, maximum and most likely % fee value.
- fixed fee type (e.g. cost plus fixed fee) please estimate a minimum, maximum and most likely fixed fee value.
- fixed total price (e.g. fixed lump sum price, fixed re-measured price) please estimate a minimum, maximum and most likely total price.
- target cost type please estimate the relevant parameters (e.g. for a G.M.P. where any cost savings or overruns are shared equally please estimate a minimum, maximum and most likely G.M.P.)

Price parameter	**Min.**	**Most likely**	**Max.**

Project Schedule

Please draw the project schedule for this contract strategy on the reverse side of this sheet. You can include as much detail as you feel necessary, but it must at least include the 3 main project activities (i.e. tender, design and construction process). Please use the **most likely** duration estimates as the duration of these activities.

ACTIVITY

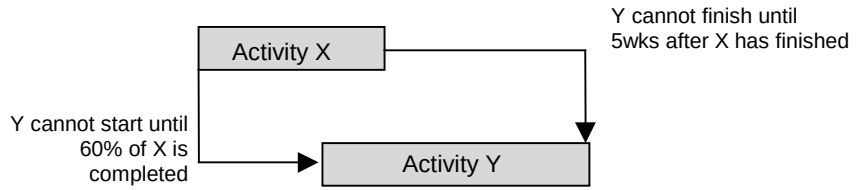


Time (weeks)

Please calibrate the Time scale

Where necessary, please annotate links between activities

Example



Contract Strategy 2

Please describe Contract Strategy 2:

Organisational Structure (e.g. Traditional, Design-Build, Management Contract, etc.):

Type of Tender Process (e.g. competitive 2-stage, negotiated, etc.):

Basis of Tender (e.g. full BoQ, drawings and specification, etc.):

Pricing Mechanism (e.g. fixed lump sum price, fixed re-measure price, G.M.P. (re-measure) with cost savings/overruns shared equally)

Major Risk allocation (if appropriate)

Any noteworthy details about the potential parties who could be employed under this contract strategy (e.g. designer's or contractor's local knowledge, market knowledge, experience, financial capacity, etc.)?

Please estimate the cost and time elements for Contract Strategy 2:

Project Element (for definitions see page 1)	COST ESTIMATE (£K)			TIME ESTIMATE (weeks)		
	Min.	Most likely	Max.	Min.	Most likely	Max.
Design						
Tender process						
Transaction costs				N/A	N/A	N/A
Construction						

Contractor's mark-up

Note: if the pricing mechanism is a:

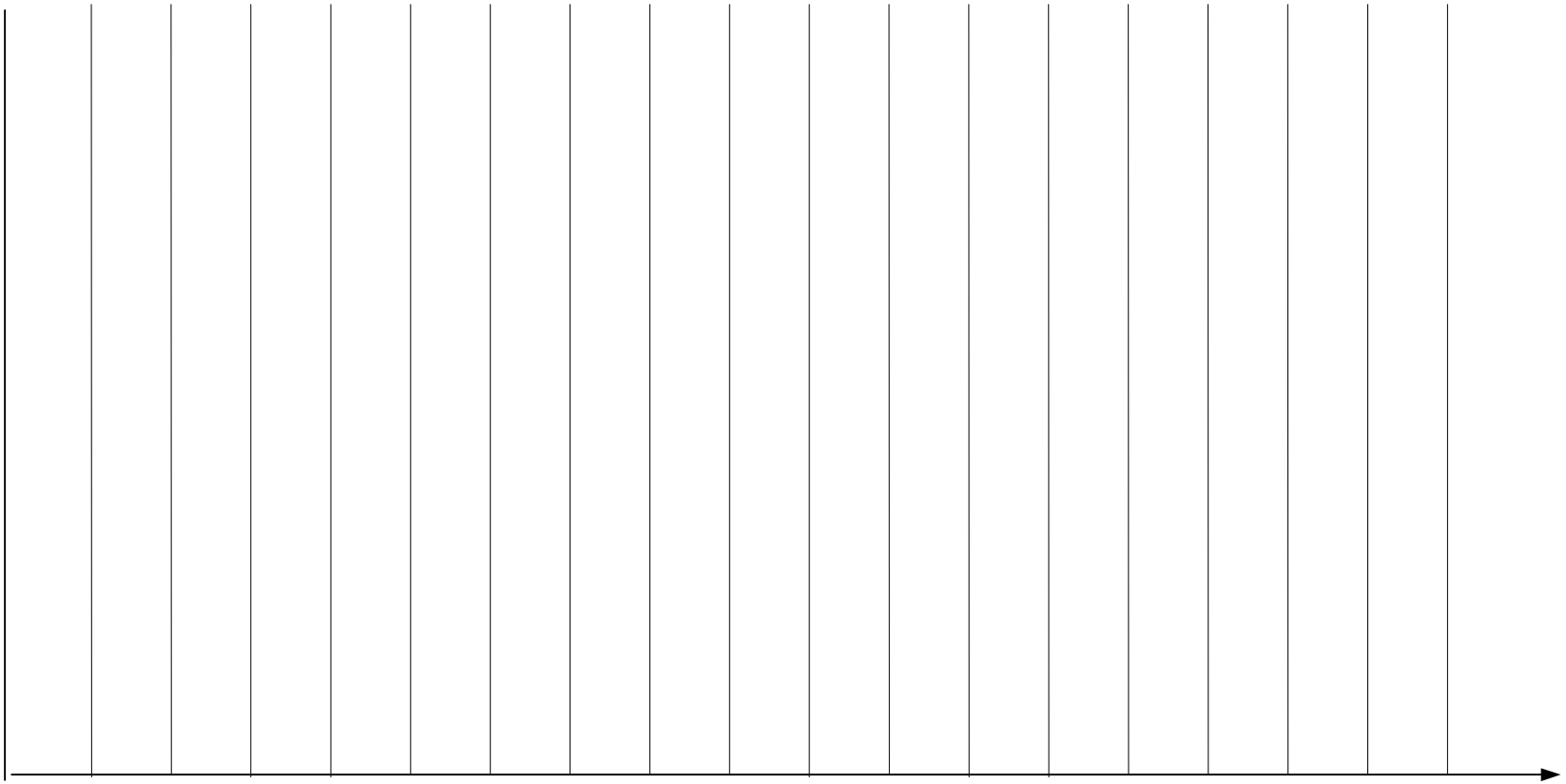
- % fee type please estimate a minimum, maximum and most likely % fee value.
- fixed fee type (e.g. cost plus fixed fee) please estimate a minimum, maximum and most likely fixed fee value.
- fixed total price (e.g. fixed lump sum price, fixed re-measured price) please estimate a minimum, maximum and most likely total price.
- target cost type please estimate the relevant parameters (e.g. for a G.M.P. where any cost savings or overruns are shared equally please estimate a minimum, maximum and most likely G.M.P.)

Price parameter	**Min.**	**Most likely**	**Max.**

Project Schedule

Please draw the project schedule for this contract strategy on the reverse side of this sheet. You can include as much detail as you feel necessary, but it must at least include the 3 main project activities (i.e. tender, design and construction process). Please use the **most likely** duration estimates as the duration of these activities.

ACTIVITY

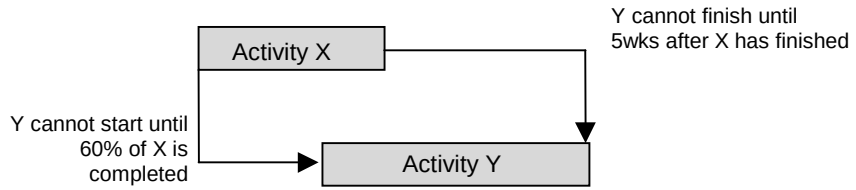


Time (weeks)

Please calibrate the Time scale

Where necessary, please annotate links between activities

Example



Contract Strategy 3

Please describe Contract Strategy 3:

Organisational Structure (e.g. Traditional, Design-Build, Management Contract, etc.):

Type of Tender Process (e.g. competitive 2-stage, negotiated, etc.):

Basis of Tender (e.g. full BoQ, drawings and specification, etc.):

Pricing Mechanism (e.g. fixed lump sum price, fixed re-measure price, G.M.P. (re-measure) with cost savings/overruns shared equally)

Major Risk allocation (if appropriate)

Any noteworthy details about the potential parties who could be employed under this contract strategy (e.g. designer's or contractor's local knowledge, market knowledge, experience, financial capacity, etc.)?

Please estimate the cost and time elements for Contract Strategy 3:

Project Element (for definitions see page 1)	COST ESTIMATE (£K)			TIME ESTIMATE (weeks)		
	Min.	Most likely	Max.	Min.	Most likely	Max.
Design						
Tender process						
Transaction costs				N/A	N/A	N/A
Construction						

Contractor's mark-up

Note: if the pricing mechanism is a:

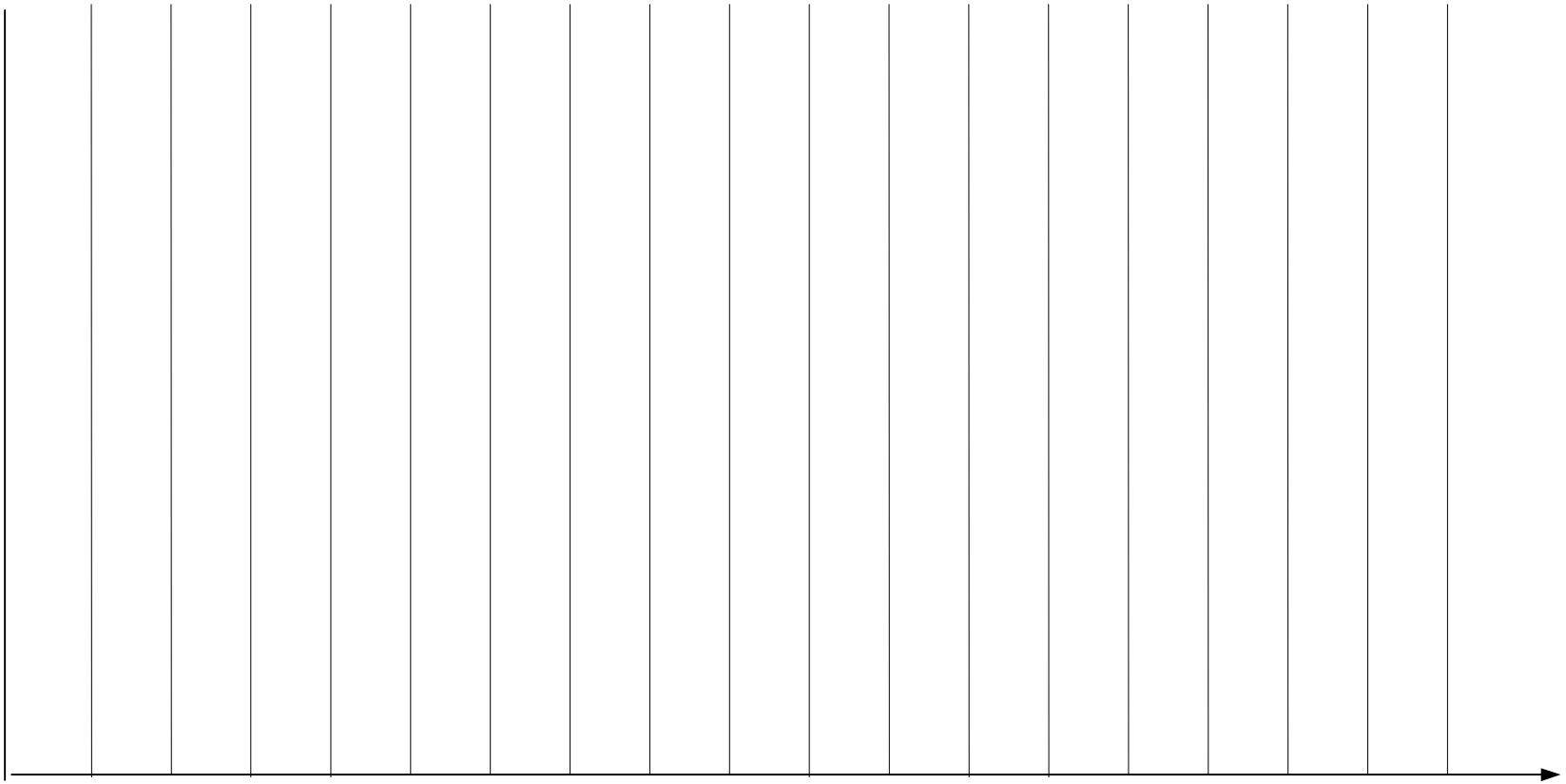
- % fee type please estimate a minimum, maximum and most likely % fee value.
- fixed fee type (e.g. cost plus fixed fee) please estimate a minimum, maximum and most likely fixed fee value.
- fixed total price (e.g. fixed lump sum price, fixed re-measured price) please estimate a minimum, maximum and most likely total price.
- target cost type please estimate the relevant parameters (e.g. for a G.M.P. where any cost savings or overruns are shared equally please estimate a minimum, maximum and most likely G.M.P.)

Price parameter	**Min.**	**Most likely**	**Max.**

Project Schedule

Please draw the project schedule for this contract strategy on the reverse side of this sheet. You can include as much detail as you feel necessary, but it must at least include the 3 main project activities (i.e. tender, design and construction process). Please use the **most likely** duration estimates as the duration of these activities.

ACTIVITY



Time (weeks)

Please calibrate the Time scale

Where necessary, please annotate links between activities

Example