HOW GAME THEORY CAN CHANGE THE ROLE OF PROCUREMENT?
GAME THEORY IS...

...widely known

80% of all participating senior Procurement professionals have heard about game theory before
GAME THEORY IS THE CUTTING-EDGE RESEARCH THAT CAN MAKE A BIG DIFFERENCE FOR PROCUREMENT

**Mechanism design** (Myerson et al.)
How to shape the rules of a game (e.g. in negotiations) to your advantage

**Market design** (Roth, Tirole)
How to create functioning markets and enable competition to work its magic

**Process design** (Selten, Nash)
Thinking the negotiation and cross-functional engagement through from the end

**Incentives & organisations** (Kahnemann)
How to set the right incentives for everyone to pull in the desired direction
THE NEGOTIATION DESIGN CAN MAKE ALL THE DIFFERENCE – A QUICK THOUGHT EXPERIMENT
WHY DOES THE NEGOTIATION DESIGN MATTER?
A QUICK THOUGHT EXPERIMENT....(1/2)

3 bidders with the following fallbacks (= mandate): Supplier A – 120, Supplier B – 110, Supplier C – 100

**ENGLISH DYNAMIC**

1

**DUTCH TICKER**

2

‘first price mechanism’

**ENGLISH TICKER**

3

‘Second price mechanism’

Always exactly the same situation (same bidders, same fallbacks, interestingly also the same winner) but three completely different prices! A suboptimal design leaves money on the table...
HOW TO BRING GAME THEORY TO LIFE IN PROCUREMENT?
AREAS OF APPLICATION...

1. How to negotiate using fixed rules and commitment?
2. How to secure the buy-in from stakeholders?
3. How to create markets where market forces do not work?
4. How to embed the key principles into an organisation and process?

Organisations & processes

Negotiation design & commitment

Cross-functional integration

Market design & development
A COMMITTED NEGOTIATION REQUIRES A MONETARY EVALUATION AND REORDERED PROCESS STEPS

Conventional awarding process

- Offer phase (RfQ)
- Quote summary
- Service level & technical talks
- Negotiations/'bidding'
- Evaluation and decision
  - Cross-company stakeholders

Committed awarding process

- Offer phase (RfQ)
- Quote summary
- Service level & technical talks
- Monetary evaluation
  - Cross-company stakeholders
- Negotiation design
- Commitment
- Communication & negotiation
USE OF COST TO THE BUSINESS INSTEAD OF QUALITATIVE MEASURES

QUALITATIVE SCORING

TRAFFIC LIGHT CATEGORISATION

MONETARY EVALUATION

82/100

NOT ENSURING A TRUE LIKE-FOR-LIKE

GBP

COMMON UNIT OF MEASURE
The bonus/penalty ensures that the supplier with the best total-value-of-ownership wins.

Artificial increase of quoted prices (penalty)  
Artificial decrease of quoted prices (bonus)

Comparison Price

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Comparison Price</th>
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<tbody>
<tr>
<td>Supplier A</td>
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<td>Supplier B</td>
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</table>

Quoted price  
Penalty for payment terms  
Penalty for lack of flexibility  
Bonus for good quality  
Net Bonus / Penalty

Like-for-like comparison
IN THE FINAL NEGOTIATION, THE TAILORED MECHANISM DESIGN IS KEY

**Information for development of negotiation strategy**
- Number of suppliers
- Challenger vs. incumbent
- Price differences
- Danger of collusion
- Strategic importance
  - Market entry
  - Capacity utilization
  - Reference client
- Future business
- Market shares of contractors
- Technologies used by suppliers
- Raw material content
- Raw material development
- Price developments
- ...

**Negotiation elements**
- Parallel negotiations
- Sequential negotiations
- Negotiation windows (Windows of Opportunity)

**Take-it-or-... elements**
- Take-it-or-leave-it
- Take-it-or-best-offer
- Take-it-or-auction
- Take-it-or-competition

**Dynamic elements**
- English process
- Dutch process
- Brazilian process
- Hong-Kong process

**Ranking elements**
- Quote of ranking
- Strategic ranking
- Ranking based on non-price elements

**Sealed bid elements**
- First price sealed bid
- Second price sealed bid

**Hybrid elements**
- Anglo-Dutch negotiation
- Individual negotiation formats combining various elements
PROJECT DESCRIPTION

- Negotiation of 4 packages:
  - Spec Type 1
  - Spec Type 2
  - Spec Type 3
  - Spec Type 4
- Five suppliers were admitted:

<table>
<thead>
<tr>
<th>Suppliers / Packages</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
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<tbody>
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CHALLENGES

- Limited supplier set:
  - Incumbent (previously chosen)
  - Challengers from Asia, but no track record with client
- Different technological concepts and efficiencies
- „Total-Cost-of-Ownership“-analysis necessary due to deviations from specifications
- Substantial growth expected (capacity and investment required)
- Split across packages likely to change after sourcing
- Partly huge price asymmetries between suppliers after RFQ

TWS SUPPORT

- Support of RFQ development (pricing templates) & analysis
- Facilitation of bonus/penalty assessment to establish TVO perspective
- Development of multi-phase negotiation design
- Facilitation of internal alignment (approval paper)
- Creating of documents required for negotiation
  - Calculation tools
  - War room tool
  - Communication documents
  - Bid sheets
- Support during negotiations
Qualification price for Package 2 given to all admitted suppliers

First round starting with Package 2

Option 1: Only one supplier accepts the qualification price ➔ Supplier wins the package

Option 2: More than one supplier accepts the qualification price ➔ Decreasing ticker until package is awarded (English-type process)

Option 3: No supplier has accepted the qualification price ➔ Take-it-now-offers until package is awarded (Dutch-type process)

Take-it-now-offers to winner for some or all remaining packages (1, 3-4) or bundles of packages

Starts with Package 2 and is repeated for remaining packages or bundles of packages
WHICH IMPACT HAS THE METHODOLOGY ON THE ROLE OF PROCUREMENT?

PROCUREMENT

- Negotiation design & commitment
- Cross-functional integration
- Market design & development
- Organisations & processes
Dave Owen, Global Purchasing Director at Jaguar Land Rover, at CIPS Annual Conference 2016

“Game theoretic thinking has become interwoven into the fabric of the JLR Purchasing Way:

- Commitment and intelligence ousts leverage and scale
- Purchasing leading instead of being led
- Being better informed allows us to act more intelligently and influential
- Prepare for every major sourcing project as if you are buying a business”
SURVEY RESULTS – WHAT’S THE STATE OF THE INDUSTRY?
GAME THEORY IS...

...widely known

80% of all participating senior Procurement professionals have heard about game theory before
91% of users confirm that game theory creates value add for Procurement.

80% of non-users believe that game theory creates value add for Procurement.
BROAD APPLICABILITY

80% of all participants don’t perceive any limitations when it comes to the application of game theory.

- low complexity ✔
- medium complexity ✔
- high complexity ✔
HOWEVER...

...only 9% of the all participants use game theory in Procurement today
HOWEVER...

...only 9% of the all participants use game theory in Procurement today.
SIZE MATTERS!

...only 6% of the all participants who work in companies with a sourcing volume USD <1bn use game theory

24% of the all participants who work in companies with a sourcing volume USD >1bn use game theory
THANK YOU!

MORE INFORMATION AVAILABLE ON CIPS.ORG > KNOWLEDGE > GAME THEORY

Your contacts at TWS in the UK

Sebastian Moritz – Director
sebastian.moritz@tws-partners.com
+44 7377 868743