

Procurement Optimisation

Example: Decision support in negotiations



Agenda

- 1. Areas of expertise and approach**
2. Case study 1
3. Case study 2
4. Area of applications for auctions
5. Project references in the procurement context
6. Project references for sales

We support procurement as well as sales organizations by using a tool set based on game and auction theory as well as microeconomic engineering

Areas of expertise (1/3)

- » Developing and applying negotiation strategies based on game theory (mechanism design)
- » Designing procurement auctions
- » Simulations in the area of procurement auctions
- » Training of 1:1 situations
- » Conducting and/or participating in procurement auctions
- » Derivation of „optimal“ strategies in procurement and/or split-award auctions to reduce the purchasing costs
- » Analysis of bidding behavior
- » Guidance and lessons for procurement managers

We convert game theory findings to monetary benefits for our customers, covering a wide range of application fields.

We optimize procurement strategies and/or organizations

Areas of expertise (2/3)

- » Designing purchasing processes in order to minimize the procurement costs and ensure the independence from a single (group of) supplier(s)
- » Developing global sourcing strategies and/or organizations
- » Developing e-sourcing strategies, cross functionally optimized purchasing processes and corresponding complex business rules
- » Applying different procurement constraints in an interactive manner to select the “right” set of suppliers
 - Min / max number suppliers
 - Lower / upper bound for overall quantity per supplier
 - Lower / upper bound for overall quantity per supplier and item
 - Lower / upper bound for overall spend per supplier or group of suppliers

We help you to improve your procurement department!

We optimize sales strategies and/or organizations

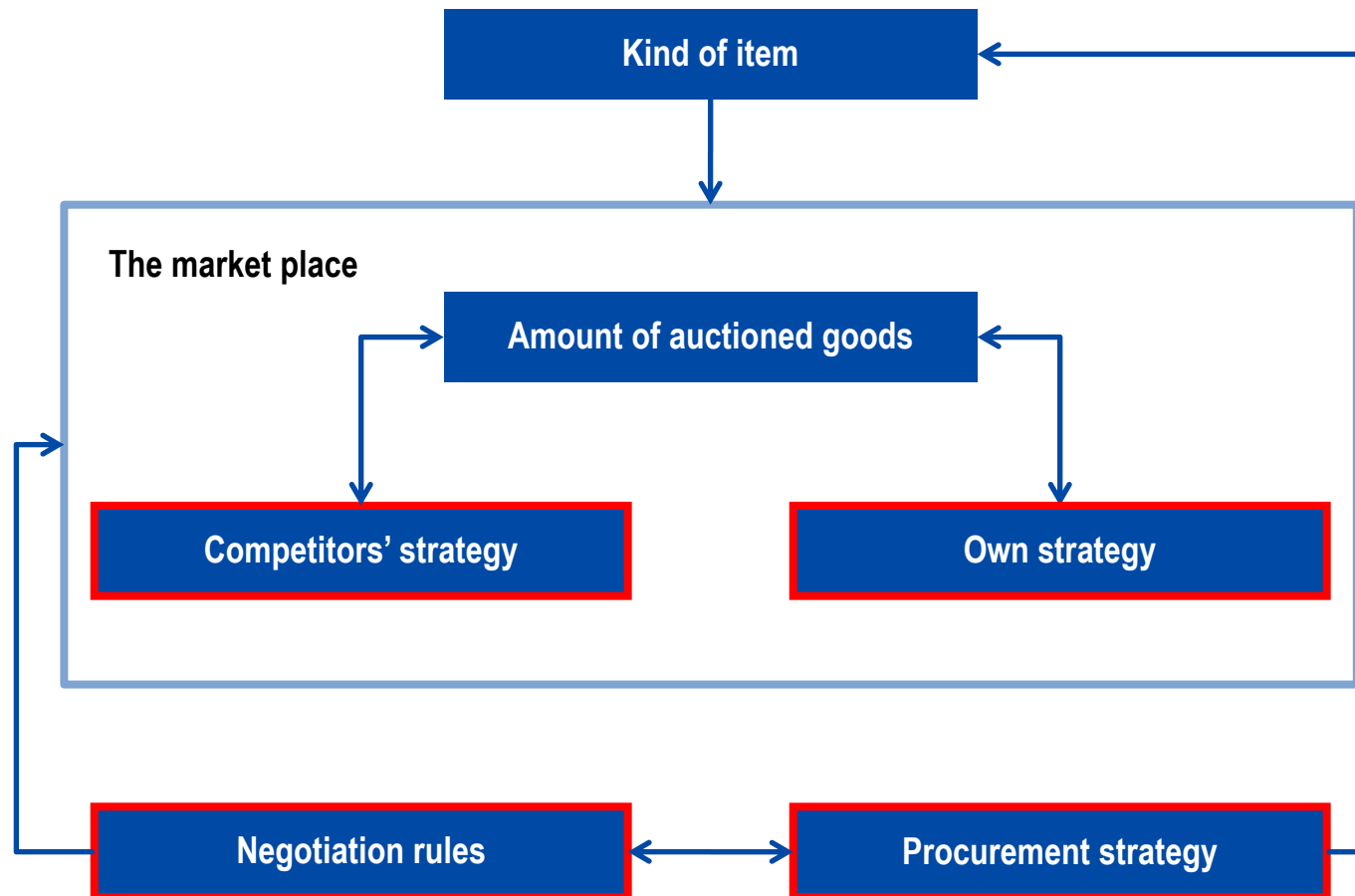
Areas of expertise (3/3)

- » Developing sales strategies
- » Designing sales processes in order to maximize the revenue
- » Optimizing processes and saving time for sellers
- » Negotiation support in M&A projects or major strategic projects
- » Applying and proposing various sales auctions
- » Real-time sales analysis and support within auctions
- » Developing custom decision support tools for sales auctions
- » Negotiation support in sales auctions

We help you to improve your sales strategy!

The definition of parameters to set up the decision support system have to been worked out in the preparation phase of the bid

Influencing factors



Required external parameters to be considered in the development of the bidding strategy

External influencing factors

Negotiation rules	Procurement strategy	Competitors' strategy
<ul style="list-style-type: none">» Sealed bid vs. dynamic auction» Sequential vs. parallel auction» Activity rules / eligibility» Termination rules» Bid language (bundle vs. single item)» Price Rule:<ul style="list-style-type: none">• First/Second Price• More complex rules» Feedback during and after the auction to bidder (When and what?)» Winner determination	<ul style="list-style-type: none">» Quality-Price trade off» Amount of auctioned product» Contract period» Procurement policies<ul style="list-style-type: none">• Min / max number suppliers• Lower / upper bound for overall quantity per supplier• Lower / upper bound for overall quantity per supplier and item• Lower / upper bound for overall spend per supplier or group of suppliers» Role of the purchasing within the buying center	<ul style="list-style-type: none">» Cost structure / Margin» Market strategy» Relative competitiveness» Commercial capabilities» Technical capabilities

Required internal parameters to be considered in the development of the bidding strategy

Internal decision parameter to define the scope of the bidding strategy

Own strategy

- » Definition of walk away prices for the product / technology matrix
- » Definition of requested bundles and synergies
- » Definition of minimum and maximum objectives (margin, turnover) per item / bundle / overall
- » Definition of target items
- » Target setting according to the market strategy (e.g. market / delivery share, profitability, etc.)
- » Definition of scope / action profiles
- » Definition and approval of bidding strategy by the management
- » Setting up of the decision support tool

The internal and external parameters have to be identified and named – afterwards, the parameters can be structured

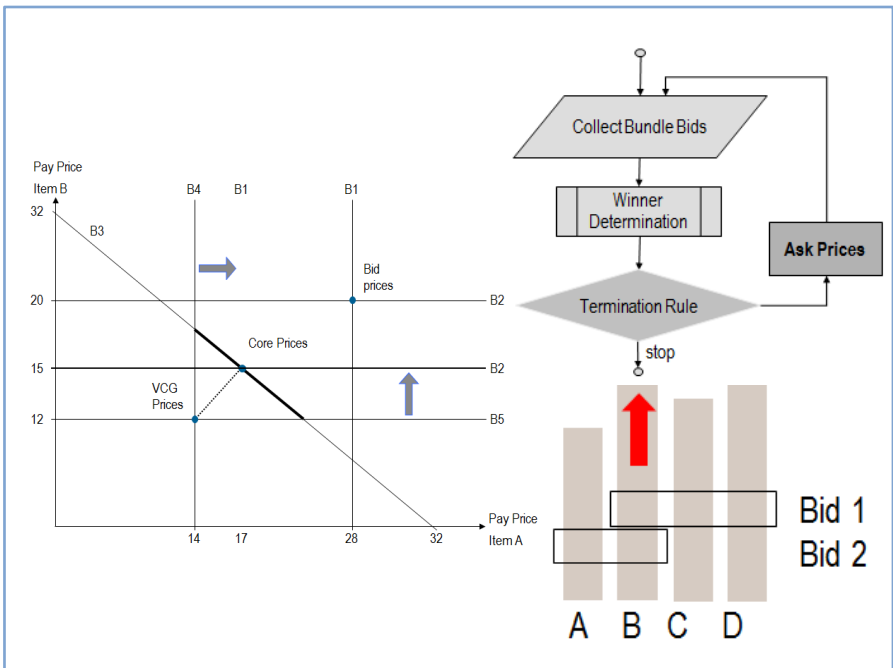
Combination of internal and external parameters

Parameter identification

Procurement: Sugar	Potential suppliers			
	L1	L2	L3	L4
100t in Augsburg	30	80	100	30
5t in Munich	0	5	5	0
20t in Vienna	20	10	20	10
Bid Price (in thousand €)	€ 150	€ 125	€ 300	€ 125

Auction 1	Auction 2	Auction 3	Auction 4	Auction 5	Time
<input type="checkbox"/> Tool 1	<input type="checkbox"/> Tool 4	<input type="checkbox"/> Tool 6	<input type="checkbox"/> Tool 9	<input type="checkbox"/> Tool 11	→
<input type="checkbox"/> Tool 2	<input type="checkbox"/> Tool 5	<input type="checkbox"/> Tool 7	<input type="checkbox"/> Tool 10	<input type="checkbox"/> Tool 12	
<input type="checkbox"/> Tool 3		<input type="checkbox"/> Tool 8		<input type="checkbox"/> Tool 13	

Parameter structure



It is indispensable to structure all internal and external decision parameters in order to develop bidding strategies!

Tailor-made simulations and a decision support system are created based on internal and external parameters

Simulations and decision support systems

Simulations

Item/bundle	Start price	Market price	Your current bid price	Round	ABC	Allocation	Revenue
Item 1				1	0*	[1, ABC]	0
Item 2				1	0		
Item 3				1	0	[2, ABC]	30
Item 1 + Item 2				1	30*		
Item 1 + Item 3					30		

The market place

	Bids		Market price	
	Large tranche	Small tranche	Large tranche	Small tranche
Me	x	o	770	150
Competitor B	x	o		
Competitor C	x	o		

Increment large tranche

Decrement large tranche

Increment small tranche

Decrement small tranche

Decrement large and smalltranche

	Agent 3	0	0	0	Me
5	Agent 1	0	0	0	Competitor B
	Agent 2	0	0	0	Competitor C
	Agent 3	0	0	0	
6	Agent 1	0	0	0	
	Agent 2	0	0	0	
	Agent 3	0	0	0	
7	Agent 1	0	0	0	
	Agent 2	0	0	0	
	Agent 3	0	0	0	

Decision support system

Simulation parameter

Number of competitors

Risk attitude (Risk averse vs. Risk seeking) of each competitors

Regions where they can supply

Cost estimation

Strategy estimation

Current allocation

Number of (currently) winning items

Overall pay price

Overall costs

Overall margin

Current best allocation to obtain the minimum allocation

Number of (currently) winning items

Overall pay price

Overall costs

Overall margin

The simplified decision support system

Item	Old price	My current price	Current best price	Marginal Cost/Quality	Old margin	Current margin	Walk away margin
	70	780	770	770	275	505	495
	30	160	150	150	175	-15	-25

Simulations and decision support systems prepare you for the real auction and verify bidding strategies!

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As first step of Areas of expertise and approach, we structured the external parameters for split award auctions

External influencing factors

Negotiation rules	Procurement strategy	Competitors' strategy
<ul style="list-style-type: none">» Dynamic auction» Parallel auction» Eligibility: You have to submit a bid within any round, otherwise you are not able to bid in the next round» Termination rule:<ul style="list-style-type: none">• As soon as there is no overdemand, i.e. the demand is smaller or equal to the offer, the auction terminates» Single item bid language» First price payment rule» Feedback:<ul style="list-style-type: none">• Is there overdemand or not?» The price decrement "tick" per round is 10	<ul style="list-style-type: none">» A split award auctions is used for the purchasing of microcontrollers due to several reasons:<ul style="list-style-type: none">• Risk consideration• Avoidance of dependence / monopoly structure• Insurance premium: If one supplier goes bankrupt, another one will be available• Larger number of suppliers is induced to bid» The purchase department requests 2 tranches of 100.000 microcontrollers	<ul style="list-style-type: none">» Competitors use a best response respectively straightforward strategy:<ul style="list-style-type: none">• Since each bidder is only allowed to win a single tranche, they only bid on that tranche that maximizes the margin given the current prices• Straightforward bidding is an ex-post equilibrium» The marginal cost / quality function for each competitor i has been estimated:<ul style="list-style-type: none">• $TC_i = a * q^2 + b * q + K$ whereas<ul style="list-style-type: none">• a is the quality factor• b are the variable costs• K are the fixed costs

Internal parameters have been defined to develop the straightforward and powerset bidding strategy

Internal decision parameter

Own strategy

- » Walk away prices for both tranches have to be defined
- » The target tranches have been defined
- » Targets have been set according to the market strategy (market entrance vs. market protection)
- » Minimum and maximum objectives per tranche / overall have been defined
- » Action profiles are determined:
 - Straightforward bidding
 - Powerset bidding: Bid on all tranches that generate a positive margin given the current prices
- » The powerset and straightforward bidding strategy are approved by the management
- » The decision support tool has been implemented

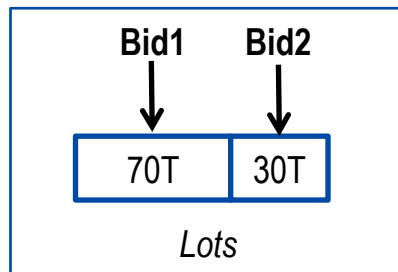
Internal and external parameters have been identified and named – besides, an activity diagram structures the parameters

Combination of internal and external parameters

Parameter identification

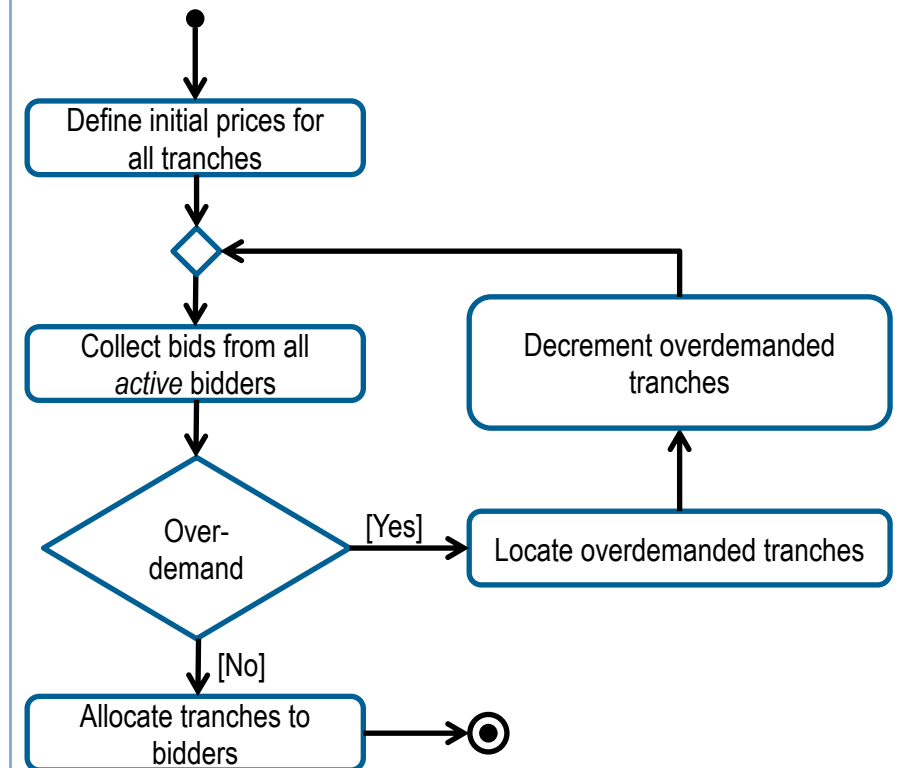
» Two items:

- Large tranche
- Small tranche
- Each supplier can win at most 1 tranche but bid on both tranches



- » 3 other sales departments act as competitors
- » 1 procurement department acts as auctioneer

Parameter structure



The simulation prepares for the real auction while the decision support system provides a management summary

The simulation and decision support system

Simulations

The market place

	Bids		Market price	
	Large tranche	Small tranche	Large tranche	Small tranche
Competitor A	x	o	480	50
Competitor B	x	o		
Competitor C	o	o		

Increment large tranche

Decrement large tranche

Increment small tranche


Decrement small tranche

Decrement large and smalltranche

Decision support system

The simplified decision support system

Item	Old price	My current price (0 means I get off the auction)	Current best price	Marginal Cost/Quality	Old margin	Current margin	Walk away margin
70	490	0	480	310	180	-310	400
30	60	0	50	190	-130	-190	200



Microsoft Excel Worksheet

We show you the prototype in the demo session!

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As first step of our approach, we structured the external parameters for a sales auction

External influencing factors

Negotiation rules	Procurement strategy	Competitors' strategy
<ul style="list-style-type: none">» Dynamic auction» Combinatorial clock auction» Eligibility: You have to submit a bid within any round, otherwise you are not able to bid in the next round» Termination rule:<ul style="list-style-type: none">• As soon as there is no overdemand, i.e. the demand is smaller or equal to the offer, the auction terminates» Bundle bids are possible» Core selecting payment rule» Feedback:<ul style="list-style-type: none">• Provisional allocation• Current market prices» The price decrement is depending on the current demand	<ul style="list-style-type: none">» Combinatorial clock auction to allow bidders to express their synergies» Avoidance of the exposure problem, i.e. that bidders risk only winning a fraction of their requested items» Complex value model» Incentive-compatible payment rule	<ul style="list-style-type: none">» Bid shading might be possible» Bundle selection might be due to company's strategy

Then, we summarized the market place

External influencing factors

The market place	
Setting	
#bidders	4
#lots	24
#bands (#lots)	4 (6,6,6,6)
Value model	
Max. # items per band	6
Range base valuation per item	A=[100,300] B,C,D=[50,200]
Complementarity type	Fixed, descending
Bundle sizes with complementarities	2,3
Complementarities	50-60%
Complexity for bidders	
# possible bundles	~2,400

The payment rule is modeled with an easy example to explain it to the decision makers

External decision parameter

The example

» There is only item A and B

» Bids

Bidder\Combination	A	B	AB
B1	28*		
B2		20*	
B3			32
B4	14		
B5		12	

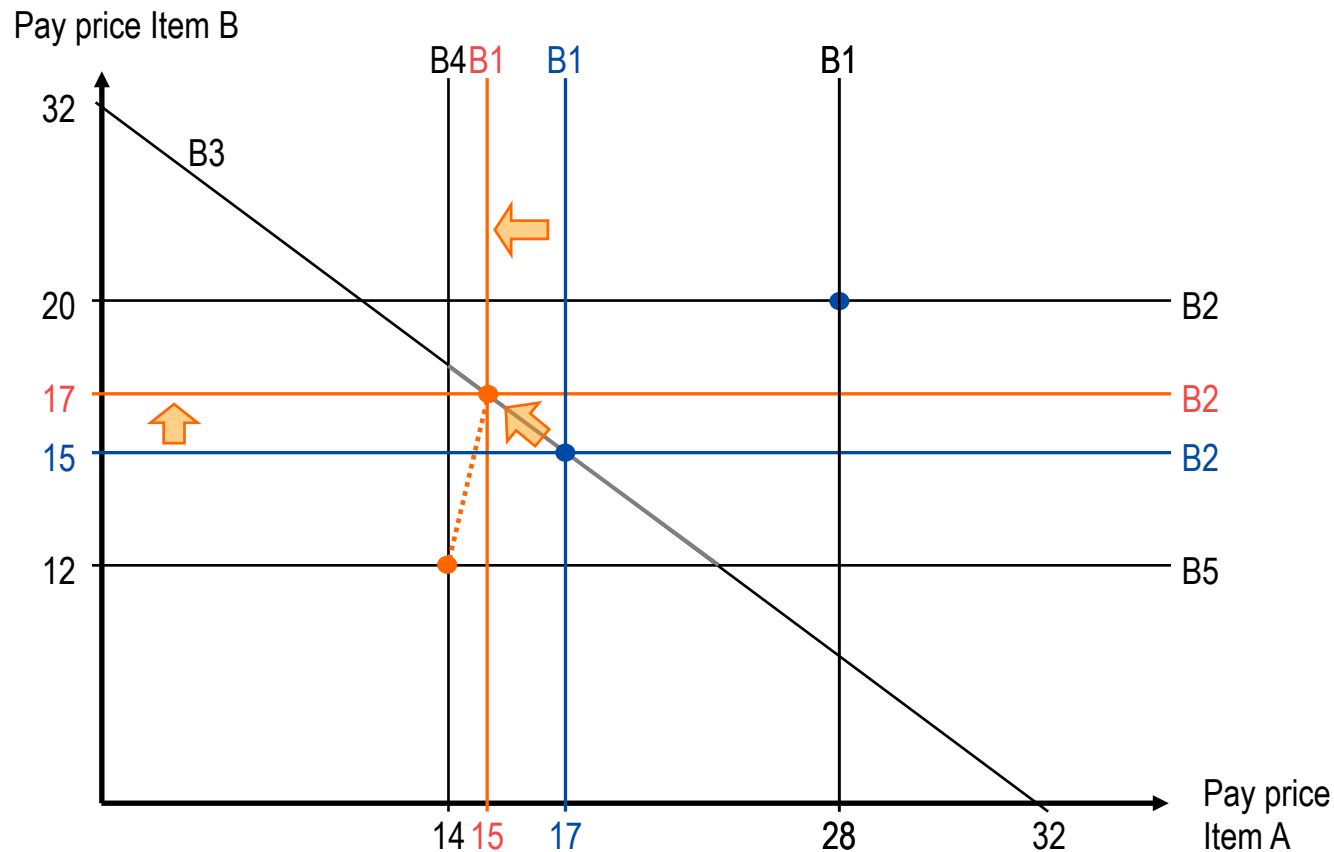
» Bidder B1 wins item A

» Bidder B2 wins item B

There is no room for speculation left because of the payment rule

Internal decision parameter

The example



- » There is only item A and B
- » B1 will never pay more than his bid price of 28
- » Only when B1 bids less than 14, he will lose his bid
- » For all bid prices between 17 and 28, B1 will always pay 17
- » If B1 bids more than 14, but less than 17, he still wins, but pays less, forcing B2 to pay more
- » In this example:
 - » B1 bids 15, and pays 15 instead of 17
 - » B2 pays 17 instead of 15

The simulation prepares for the real auction while the decision support system provides a management summary

The simulation and decision support system

Simulations

The screenshot shows a software interface for selecting bundles. On the left, there are sections for 'Home', 'General', 'Active Bids', and 'Bid Preview'. The main area is titled 'Select Bundle (Package)' and contains a table of 'Predefined Bundles' with columns for bundle name and price to bid.

Predefined Bundles	Price to bid
A(2)	200,80
A(4)	400,00
A(6)	600,00
B(2)	100,00
B(4)	200,80
B(6)	300,00
C(2)	100,00
C(4)	200,00
C(6)	300,80
D(2)	100,00
D(4)	200,00
D(6)	300,00

Decision support system

The screenshot shows a decision support system interface. It includes two summary tables at the top, an overview section with four sub-tables, and a Microsoft Excel worksheet at the bottom.

Grundwertigkeiten:	
A	170
B	98
C	111
D	170

Aktuelle Preise:	
A	120
B	65
C	65
D	65

Übersicht

Bereich: A

#Güter	Preis	Wertigkeit	Gewinn
1	120	170	50
2	240	544	304
3	360	765	405
4	480	935	455
5	600	1.105	505
6	720	1.275	555

Bereich: B

#Güter	Preis	Wertigkeit	Gewinn
1	65	98	33
2	130	314	184
3	195	441	246
4	260	539	279
5	325	637	312
6	390	735	345

Bereich: C

#Güter	Preis	Wertigkeit	Gewinn
1	65	111	46
2	130	355	225
3	195	500	305
4	260	611	351
5	325	722	397
6	390	833	443

Bereich: D

#Güter	Preis	Wertigkeit	Gewinn
1	65	170	105
2	130	544	414
3	195	765	570
4	260	935	675
5	325	1.105	780
6	390	1.275	885

Microsoft Excel Worksheet

Kombi	Bereich	C	D	Wertigkeit	Preis	Gewinn
6	6	4	==>	3.778	-	3.778

We show you the prototype in the demo session!

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Many companies apply auction and advanced game theory to design their procurement department and/or strategy

Market review

- » Most large companies have introduced e-sourcing and global sourcing programs during the past 10 years
 - 64% of companies use e-sourcing in a survey by AberdeenGroup (2007)
 - Further possibilities for savings in e-sourcing by leveraging economies of scale and scope
- » Many procurement departments and strategies have been redesigned during the past 5 years
- » The INFORMS Edelman Award recognizes outstanding practical applications of mathematical methods
 - Procter & Gamble, 14.3% in recommended savings
 - Motorola, 3.75% savings
 - Mars Inc., 6% savings



“In the long term, the real test of our success will be not merely how well we understand the general principles which govern economic interactions, but how well we can bring this knowledge to bear on practical questions of microeconomic engineering ...”

...” Alvin Roth, Harvard University - Nobel Price in Economic Sciences in 2014

An auction can be used in many use cases and provide an attractive revenue share if applied right

Use cases (1/2)

Historical usage of auctions

- » Herodotus reports that auctions were used in Babylon as early as 500 B.C.
- » 193 A.D. the Pretorian Guard sold the Roman Empire by means of an auction
 - Winner's curse: The winner Didius Julianus was murdered 2 months later
- » Wide array of commodities sold by means of auction
 - Tobacco, fish, fresh flowers
 - Bond issues by public utilities and long-term U.S. Treasury securities
 - Facilitate transfer of assets from public to private hands
 - Industrial enterprises in Eastern Europe and former Soviet Union
 - Rights to harvest natural resources such as oil and timber
 - Rights to use the electromagnetic spectrum for communications

Typical usage of auctions

- » Auctions determine the price in a trade dynamically, which is important for
 - Volatile markets
 - Scarce, exceptional goods or goods with unknown and unpredictable value
 - Markets with high competition
 - Markets with synergies
- » Alternatives:
 - List price – setting the correct list price is difficult
 - Lottery – low efficiency, low revenue
 - “Beauty contest” – low revenue, difficult process
- » Setting up an auction requires higher transaction costs compared to using a list price
- » Therefore, auctions are always attractive, when
 - Expected overall price is high, or
 - Setup cost is low

Source: Research Dr. Stefan Mayer

In case of synergies auctions are the right sales method

Use cases (2/2)

Service

» Facility services company will suggest better price per serviced house, if houses are located **nearby**

Transportation

» Transport company will suggest better per (ton*km) price if contracted for delivery from A to B **and** from B to A.

Construction

» Laying cable from A to B **and** from B to C is cheaper, taking per meter price, than just A to B.

Sales

Securing delivery of both Notebooks **and** Desktops to a big customer will allow Dell to suggest better piece price.

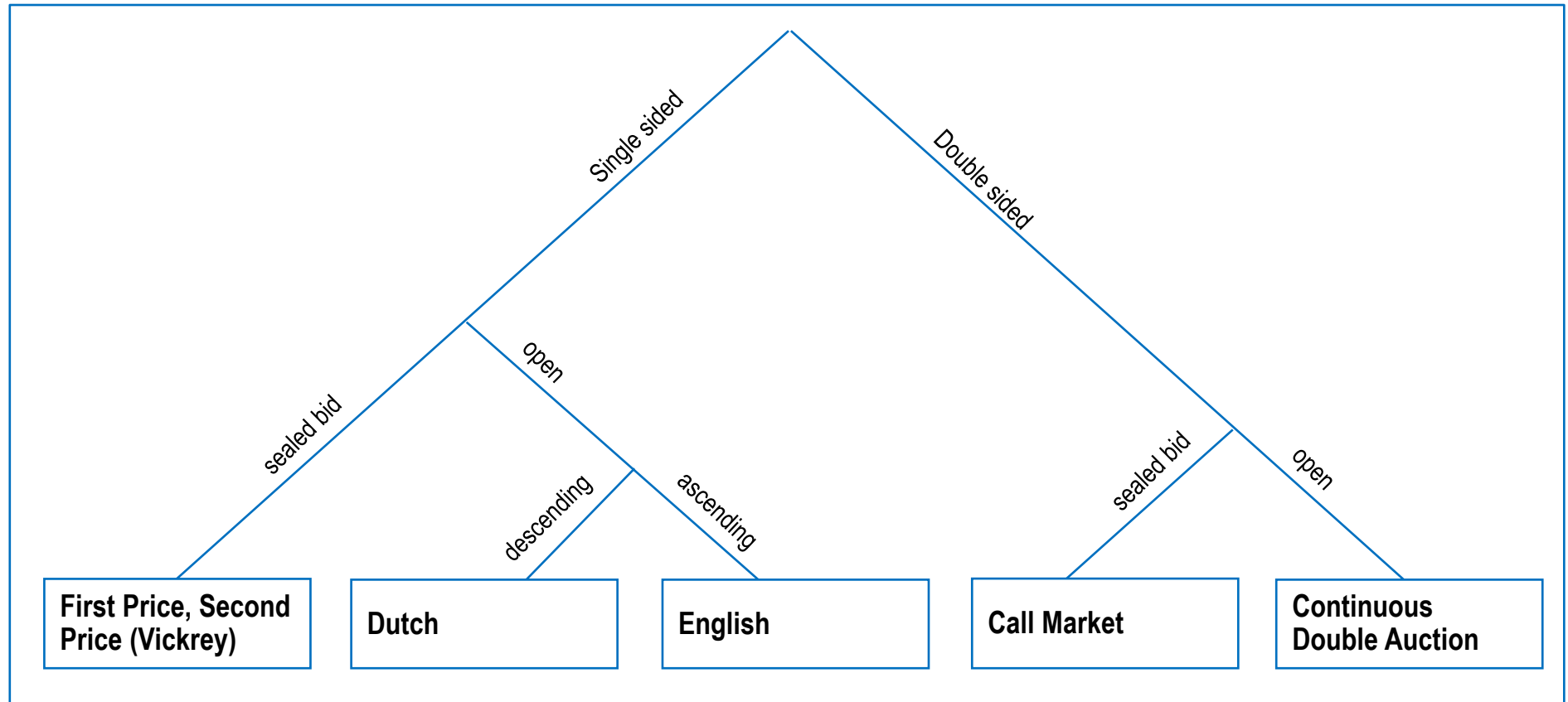
Production

» Production of tables **and** bookcases uses similar technological process and will result in a better price.

From our toolset we select the right auction format according to our clients' need

Typical auction formats (1/4)

An overview over common auction formats



Source: Research Dr. Stefan Mayer

Many procurement departments in the automotive industry use the Second Price Sealed Bid Vickrey Auction

Typical auction formats (2/4)

First Price, Second Price (Vickrey)

Dutch

English

Call Market

Continuous Double Auction

- » First Price Sealed Bid Auction
 - Bidders submit bids in sealed envelopes
 - At a pre-determined time, auctioneer opens all envelopes and ranks bids
 - Highest bidder obtains object and pays his bid amount
- » Second Price Sealed Bid (Vickrey) Auction
 - Bidders submit bids in sealed envelopes
 - At a pre-determined time, auctioneer opens all envelopes and ranks bids
 - Highest bidder obtains object and pays second highest bid amount

Optimal bidding depends on the rules of the auction.
In English and Second Price auctions, bid your costs.
In First Price auctions, shade your bid above your costs.

The amount to shade depends on the competition: More competition = Less shading

The Dutch auction is frequently used in procurement departments

Typical auction formats (3/4)

First Price, Second Price (Vickrey)

Dutch

English

Call Market

Continuous Double Auction

- » Open descending price or Dutch auction
 - Descending counterpart to English auction
 - Less common (e.g., flower markets)
- » Modeling the Dutch auction
 - Auctioneer begins by calling out a price sufficiently high so that no bidder is willing to purchase the item at that price
 - Price is gradually lowered until some bidder indicates interest in purchasing the item at a given price
 - First bidder to indicate interest obtains the item and pays the price at which they “enter” the auction

The English auction is mainly used within sales departments

Typical auction formats (4/4)

First Price, Second Price (Vickrey)

Dutch

English

Call Market

Continuous Double Auction

- » Open ascending price or English auction
 - Auctioneer begins by calling out low price and raises it in small increments provided there are two or more active bidders
 - Auction ends when there is only one remaining bidder
 - Implemented on e-Bay through proxy-bidding
- » Formal model of the English auction (aka Japanese or Clock Auction)
 - Price rises continuously and each bidder indicates willingness to remain active – i.e., holds up his/her hand
 - Once bidder finds price to be too high, he signals that he is no longer interested by lowering hand
 - Auction ends when only a single bidder has hand raised
 - Final bidder wins the object and pays the auctioneer price at which the last bidder dropped out

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We supported BASF within the VW auction for KTL and base coatings

Reference (1/4)

Challenges	Our method	Results
<ul style="list-style-type: none">» The purchase department of a German automotive manufacturer restructured the procurement of KTL and base coatings» All the suppliers face a decreasing margin	<ul style="list-style-type: none">» Analysis and documentation of the procurement procedure» Development, evaluation and review of strategies, actions and best replies within the framework of the auction process» Derivation of behavioral rules» Development and implementation of simulations and role games as preparation for the actual auction» Participation into the real auction and management support	<ul style="list-style-type: none">» Development of a deep understanding of OEM's procurement auction process» Application of strategic rules within the auction

BASF reached a high market share and a adequate margin!

Source: Project reference

We gave game theoretical insights into the second price sealed bid (Vickrey) auction of the OEM

Reference (1/4)

First price sealed bid auction

a likely outcome for the first price mechanism

bid 1: €8

bid 2: €6

bid 3: €3



Bayes-Nash equilibrium

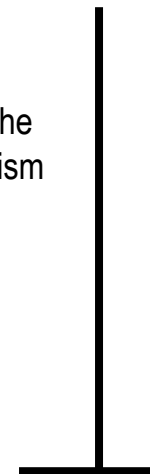
Second price sealed bid (Vickrey) auction

a likely outcome for the second price mechanism

bid 1: €5

bid 2: €4

bid 3: €2



Dominant strategy equilibrium

We derived bidding as well as best response strategies and reduced the complexity for procurement managers!

Source: Project reference

We restructured successfully the procurement policy of a leading hardware producer

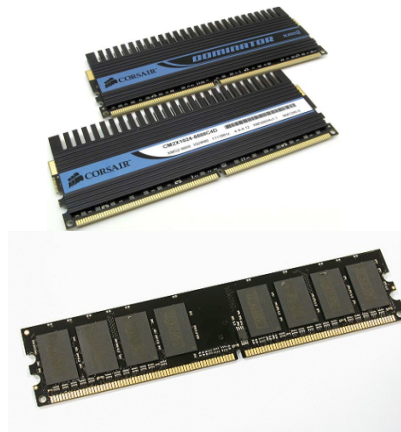
Reference (2/4)

The sourcing of large volumes of memory chips

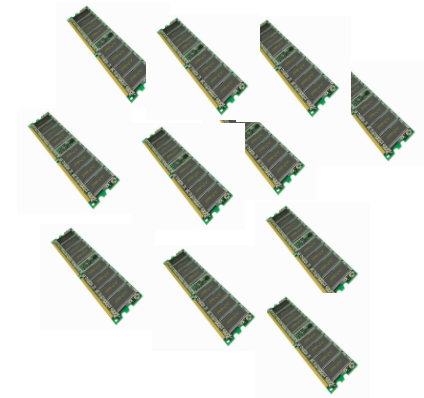
Business rules
(max. 3 winning suppliers)



Economies of scope
(Discounts on overall spend)



Economies of scale
(Discounts on volume)



We redesigned the procurement department to minimize the costs for 20 kind of different memory chips under specific business constraints!

Source: Project reference

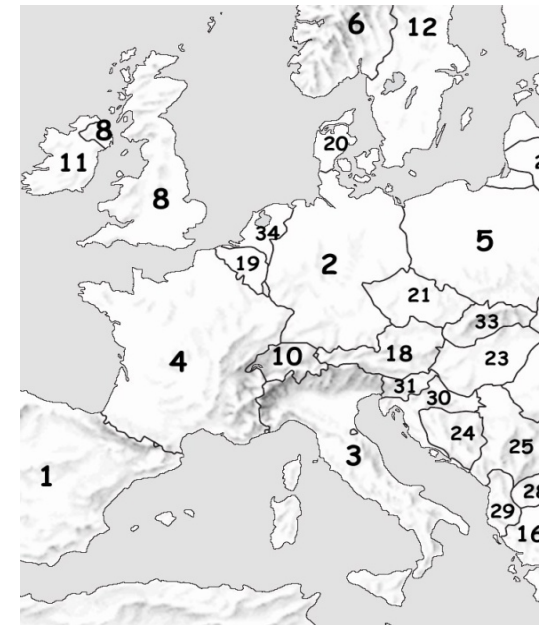
We developed successfully an auction to buy services in regions across Europe

Reference (3/4)

Challenges

- » Different geographical regions
- » 20+ suppliers - there are local suppliers and (global) suppliers which cover multiple regions
- » Global suppliers have economies of scope and provide volume discounts on larger packages
- » Complex business rules have to be defined to select the “right” suppliers

Regions



We defined an auction to reduce the procurement costs by over 11%!

Source: Project reference

We developed bidding strategies for a supplier as preparation for a procurement auction

Reference (4/4)

Different bidding strategies

- » Avoidance of the exposure problem in case of complementarities
- » Tacit collusion by bidders through signaling
- » Jump bidding can be used as a strategy
- » Budget binding: One can bind budget of other budget-constrained bidders, resulting in high prices for everyone
- » Parking: Bidders maintain their eligibility by parking in spots the bidders are not interested in, and then move to true interests later
- » Waivers and bid withdrawals open up more options for the bidding strategy (seen in a consulting project in the Czech auction)
- » Hold up: Bidders make clear that they are difficult to outbid and resell the items after the auction (if resale is allowed)

Different motivations affect competitors significantly

- » The following explanations have been used to explain companies' behavior in auctions:
 - Risk attitude
 - Companies often behave risk averse to increase the probability to win
 - Joy of winning
 - Envy
 - Spite
 - Regret
 - Strategic complexity to derive the right bid
 - Wrong expectations of other bidders behavior

Complex bidding strategies are a result of the auction format, corresponding parameters, the behavior of the competitors and the own objective.

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6. **Project references for sales**

We designed a sales mechanism for airport slots using combinatorial auctions

Reference (1/2)

MUC	
A1	7:00
A2	7:30
A3	8:00
A4	8:30



7:00 – 8:00, for 20T €

FRA	
B1	7:00
B2	7:30
B3	8:00
B4	8:30

A slot only at the departure airport does not permit landing at the arrival airport

Reference (1/2)

MUC	
A1	7:00
A2	7:30
A3	8:00
A4	8:30



7:00 – 8:00, for 20T €

FRA	
B1	7:00
B2	7:30
B3	8:00
B4	8:30

Willingness-to-pay (A1)	= 0
Willingness-to-pay (B3)	= 0
Willingness-to-pay (A1, B3)	= 20

A slot only at the arrival airport does not permit starting at the departure airport

Reference (1/2)

MUC	
A1	7:00
A2	7:30
A3	8:00
A4	8:30



7:00 – 8:00, for 20T €

FRA	
B1	7:00
B2	7:30
B3	8:00
B4	8:30

Willingness-to-pay (A1)	= 0
Willingness-to-pay (B3)	= 0
Willingness-to-pay (A1, B3)	= 20

Only slots both at the departure and the arrival airport enable airlines to offer flights – combinatorial auctions are the right tool for these sales mechanisms

Reference (1/2)

MUC	
A1	7:00
A2	7:30
A3	8:00
A4	8:30



7:00 – 8:00, for 20T €

FRA	
B1	7:00
B2	7:30
B3	8:00
B4	8:30

Willingness-to-pay (A1)	= 0
Willingness-to-pay (B3)	= 0
Willingness-to-pay (A1, B3)	= 20

Nowadays, more and more airport slots are sold via combinatorial auctions

Reference (1/2)

MUC	
A1	7:00
A2	7:30
A3	8:00
A4	8:30



7:00 – 8:00, for 20T €

FRA	
B1	7:00
B2	7:30
B3	8:00
B4	8:30

Willingness-to-pay (A1)	= 0
Willingness-to-pay (B3)	= 0
Willingness-to-pay (A1, B3)	= 20

Combinatorial auction: Multiple lots, multiple winners, indivisible bundle bids, increased complexity

Source: Project reference

In sales departments an auction market always outperforms existing posted-price mechanism of competitors when demand and prices are uncertain

Reference (2/2): Project proposal for the sales of TV advertisements

Challenges and background knowledge

- » Part of the ad-slots are sold to specific marketing campaigns that run in short-term.
- » Prices for different slots can range from 6 000€ up to 50 000€ for a duration of 30 seconds, and are set by the TV station based on historical demand.
- » Buyers are large media agencies, who purchase a set of slots with the intent to procure the best slots for each of their customers' campaigns. In the German market media agencies are currently booking slots for several hundred customers.
- » Because the amount of air-time filled by long-term customers varies,
 - the length of a slot available in the short-term market can vary between 2 and 5 minutes, and also.
 - the length of an ad varies considerably, lasting up to 1 minute.
- » For a particular channel in the markets, we investigated, there are on the order of 150 short-term slots available during the program per week. Different slots have a different reach for different customer segments or the population overall.
- » The reach of a particular slot varies over time, but there are estimates based on historical panel data available to clients of the media agencies. Clients use reach per segment (based on gender, age, or other demographics) or per population to determine their willingness-to-pay for different slots.
- » Clearly, the value of some slots, such as those during the finals of the national soccer league may be difficult to estimate and their valuation varies considerably depending on the target market of an advertiser. Apart from these high-value slots, there is also typically a segment of low-value slots, which are also difficult to price as the demand is hard to predict.

Source: Project reference

Wir würden uns freuen, bald mit Ihnen zusammenzuarbeiten

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