

A New Era in DOD Acquisition Competition

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Outline

- Competition 101
- Research for OSD CAIG/NAVAIR 4.2

Introduction

- Market environment for major defense systems is by nature a bilateral monopoly (i.e., a single buyer and single seller)
- In order for there to be competition for a system acquisition, at least two contractors must be ready, willing and able to compete

Competition in the Defense Market: Conditions for “Perfect Competition”

- Many Buyers/Many Sellers
- Homogeneous Products
- Low-Entry/Exit Barriers
- Perfect Information
- Firms Aim to Maximize Profit

Special Characteristics of the Defense Market: Buyer

- Customer is fragmented: Administration, Congress, Military services
- Defense acquisition spending has many stakeholders, interests and consequences: Military, Economic, Political (Foreign, National, Local), Social
- Varied interests, agenda, and accountabilities impede efficiency

Special Characteristics of the Defense Market: Sellers

- A publicly held company has a fiduciary responsibility to maximize shareholder value
- Profit may be maximized by:
 - Increasing demand (i.e., selling more)
 - Decreasing costs (i.e., increasing efficiency)
 - Increasing profit margins
- For defense firms
 - Demand is relatively inelastic
 - Fee percentages are closely regulated
 - Costs added to comply with regulations yield profit
 - Information about competitors is readily attainable

DoD Acquisition Competition

- Why?
 - Achieve lower cost
 - Reduce technical, schedule, and cost risks
 - Maintain or expand the industrial base
 - Technology
 - Production
- Implication: more than one source must be available

DoD Acquisition Competition

- When?
 - Competition between two or more contractors may be held during any or all phases of the acquisition framework:
 - Material solution analysis
 - Technology development
 - Engineering & manufacturing development
 - Production

Competition Approaches - Development

- Competing designs
 - Down-select prior to hardware fabrication
- Competing prototypes (funded by DOD)
 - May be at system, subsystem or component level
 - Through a partial or full development phase
- Co-development/fusion-fission/joint development leading to production competition
- COTS/NDI programs
 - Various derivatives (ROTS, MOTS, GOTS)

Competitive Prototyping

- Featured in DoDI 5000.02
- Definition (from DAU): Competitive Prototyping Strategy (CPS)--Prototype competition between two or more contractors in a comparative side-by-side test.
- Objective: increase confidence in operational performance, cost realism, and attainable production schedules.
- Many studies since early 1960's.
- Consensus: The theoretical underpinnings and rationale behind prototyping seem sound but the data neither support nor oppose its implementation to reduce technical, schedule and cost risk. This may be because there is no control group to provide an all else being equal baseline.

DoD Acquisition Competition

- What and How?
 - Level
 - System
 - Subsystem
 - Component
 - Identical items
 - Leader/Follower or TDP (with or without technical assistance)
 - Fusion/Fission (Co-development)
 - Different items
 - F³
 - Substitutes

Competition Approaches – Production

- Winner-take-all
- Split buy (aka dual source)

Establishing Alternative Production Sources

- A key to establishing competition during production often depends upon who owns the data rights
 - Build to print
 - Technical assistance from initial source to second source, with or without multiple developers
 - Form, fit and function (F³) design

Savings/Loss Metric – What Is It?

- Gross Savings – difference between the actual cost of competitive acquisition of recurring hardware and estimated cost of sole source acquisition of recurring hardware
- Net Savings – gross savings less non-recurring cost of establishing competitive program
- Net savings may be a loss
 - Cost of establishing competition may exceed gross savings

Winner Take All Competition

- Description: Competition between multiple contractors producing the same end items for the same program, with an award to a single contractor for the total production quantity being competed. The competition may be conducted annually, for some portion of the production schedule (multiple years) or for the entire production schedule (all years).

System	Percent Savings or (Added Cost)				
	Total Quantity	CAC ¹ (\$FY72)	First Lot Competed	Total Program	% Savings/ % Competed ²
Mk48 Torpedo (warhead) ³	1,032	9,717	54.3	23.7	50.9
Mk48 Torpedo (elec. assy.)	1,034	12,603	37.5	11.6	24.9
Standard Missile	5,927	51,999	(13.60)	(2.40)	(2.90)
Hawk Missile (motor parts) ³	14,498	1,534	33.4	19.9	46.7
TD-660 Multiplexer ³	3,593	9,141	35.4	14.2	35.9
AN/GRC-103 Radio Relay	963	28,863	59.1	11.9	53.8
APX-72 Airborne Transponder ⁴	27,529	3,014	32.5	9.4 or (1.6)	28.4 or (3.1)
SPA-25 Radar Indicator ³	2,011	8,919	25.3	14.2	75.1
TD-352 Multiplexer	3,741	7,399	58.1	36.0	58.0
TD-204 Cable Combiner ³	8,733	3,430	56.2	35.5	51.2
CV-1548 Converter	11,583	3,088	63.9	40.2	61.0
TD-202 Radio Combiner ³	3,692	3,258	58.1	36.5	51.1
Aerno 60-6042 Elec. Cont. Amp.	666	7,326	53.2	8.5	43.1
MD-522 Modulator-Demod.	4,805	3,112	61.4	25.9	55.0
AN/PRC-77 Manpack Radio	143,347	708	32.2	25.2	29.2
FGC-20 Teletype Set ⁵	1,980	2,091	32.6	4.0	28.8
Aerno 42-2028 Generator	1,679	645	10.7	7.3	19.0
Aerno 42-0750 Voltage Reg.	2,175	110	48.6	<u>29.9</u>	<u>58.1</u>
Average			41.1	19.5	42.6

Split-Buy Competition

- Description: Competition between two contractors producing the same end items for the same program. The competition is usually conducted annually and the contractors compete for production of a majority of the annual quantity.

<u>Program</u>	<u>(Savings) or Added Cost</u>	
	<u>Amount (\$FY85M)</u>	<u>Percent</u>
Sparrow AIM-7F	(302.3) - 114.6	(19.5) - 10.1
Sidewinder AIM-9L	(121.00)	(22.60)
Sidewinder AIM-9M	(28.40)	(5.20)
MK 46 Torpedo Main Assy	391.7	32.3
Armored Box Launcher	(71.50)	(31.90)
CG-47	(145.0) - 2133.0	(2.25) - 51.0
LSD-41	(617.00)	(25.50)
MK 182-1 Chaff Cartridge	(0.1) - 0.8	(0.3) - 1.7

Some Split-Buy Costs Not Often Measured or Considered

- Government costs for selecting, qualifying, and managing second source
- Awards to initial source for technical assistance to second source
- Claims against the government by second source for “faulty data packages”
- ECOs by second source

Should DoD Implement Production Competition to Achieve Lower Costs?

- Unambiguous “Yes”
 - If annual winner-take-all competitions can be implemented without long lead-time and high start-up cost.
 - Winner-take-all competition is used almost exclusively for lower-unit-cost, high-production end items; rarely, if ever for major systems.
- Questionable
 - Split-buy competition has mixed cost savings results
- Impossible to Measure Effects
 - Co-development programs leading to annual split-buys.

The Defense Sellers Market: Changes Since Cold War

of Major U.S. Contractors for Defense Market

Sectors*	1990	2008
Tactical Missiles	13	5
Strategic Missiles	3	2
Fixed Wing Aircraft	8	4
Rotary Wing Aircraft	4	4
Expendable Launch Vehicles	6	3
Satellites	8	4
Surface Ships	8	2
Torpedoes	3	2
Tactical Wheeled Vehicles	6	8
Tracked Combat Vehicles	3	1

* Excludes foreign companies that have entered the U.S. market – such as BAE and Airbus.

Study Objectives

- Compile a comprehensive database of competition studies
- Extract & organize key study info by program to enable alternative views of the info (e.g., by competition approach, by commodity group, etc.)
- Develop insights to facilitate future program decision making re. acquisition strategy
- Create framework to enable acquisition community (i.e., PM, PCO & cost analyst) evaluation of alternative acquisition strategies

Database Status

- Delivered preliminary database of studies
 - ~ 250 studies (another 20 pending)
 - ~ 40% Hard Copy (filtering those to be scanned)
 - ~ 60% PDF (about 1/2 searchable, filtering those to translate)
 - Most studies pre-date 1990
 - Studies cover more than 200 discrete weapons, subsystems, components
 - About 40% of the studies include savings/loss estimates

<u>DATE</u>	<u>AUTHOR(S)</u>	<u>ORGANIZATION</u>	<u>CLIENT</u>	<u>DOCUMENT #</u>	<u>TITLE</u>	<u>TYPE</u>	<u>WEAPON SYSTEM(S)</u>	<u>Savings Estimate</u>	<u>Other Cost Effects</u>	<u>Comments</u>
1989	Pilling, Donald L.	The Brookings Institution		0-8157-7081	Competition in Defense Procurement: Studies in Defense Policy	policy analysis; competition model	FFG Frigate CG-47 Cruiser LSD-41 Dock-landing Ship MCM Mine Countermeasure Ship SSN Submarine F100, F110 Engines	Quote	N/A	Proposes an alternative model for analyzing competition.

Findings Template

Program	Competition Type		Production Savings/Loss %/(%)		Other Effects	Type of Data	Data Included?	Data Analysis Documented?	Comments
	Development	Production	Gross	Net					
F-100/F-110 Engine		Split Buy							
Pilling 1(6 annual buys)			(-5.5)		Reliability, Quality, Industrial Base, Military Capability	USAF Estimates	No	No	Savings estimate prior to competition
Pilling 2 (1 followed by 5)			(-6.0)			USAF Estimates	No	No	Savings estimate prior to competition
Camm (RAND)			N/A	N/A	Risk				
Tyson (IDA)			N/A	N/A	Logistics support				
Appendix A									
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CG-47									
SAIC 1987		Split Buy	+51.0 to -2.25	N/A		Cost, Quantity, Man Hours	Yes	Yes	Difference due to treatment of 1st Ingalls ship
NCCA 1989 (GE-0145)		Split Buy	-16 to -19			Cost, Quantity	Yes	Yes	Difference due to discounting vs. constant \$
RAND R-3966		Split Buy							References 1989 NCCA Study (above)
Naval Postgraduate School 1990		Split Buy	-19.6	-18.5		Nonrecurring, Cost, Quantity	Yes	Yes	
TASC 1988		Split Buy	-4.1 to -4.5			Learning Curve	No	No	Compared NCCA to TASC estimates
NCCA 1989 (GE-0133)		Split Buy	-19.6	-18.5		Nonrecurring, Cost, Quantity	No	No	Summary data only; notes economic climate for shipyards
NCCA 1988 (GE-0350)		Split Buy		-19			No	No	Graph with data points
NCCA 1989 (MI-0254)		Split Buy					No	No	Graph with data points
APRO 1982		Split Buy	N/A	N/A		N/A	No	No	Compares LC slope before and after competition; looks at production rate; NAVAIR cited as source

Questions

- For you – Do you have any competition studies to contribute to the database?

- For us?