Transaction Cost Economics (TCE) and Cost Estimation Methodology

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**Report Documentation Page**

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OUTLINE

• OVERVIEW: TCE AND COSTS
• FINDING TRANSACTION COSTS IN DOD PROGRAMS (Diana Angelis)
• WHAT’S NEXT?
OVERVIEW

• ENTERING HYPOTHESIS
• TRANSACTION COST ECONOMICS (TCE)
  – MAKE OR BUY, AND ASSOCIATED DIFFICULTIES
• OUR VIEW OF TCE AND COST ESTIMATION
ENTERING HYPOTHESIS

• …namely cost drivers are more complex than current methodology considers.

• Cost = f(“Production” Costs, Transaction Costs)
  – Production Costs = g(WBS, systems integration)
  – Transaction Costs = Coordination and Motivation Costs

• Can a more complete view of costs improve cost estimation methodology?
Transaction Cost Economics

• STUDY OF “VERTICAL” FIRM BOUNDARIES
• KEY PARTS OF WORLD VIEW
  – MARKETPLACE IS NOT A FRICTIONLESS, COSTLESS MEDIUM
  – ENTERPRISES ARE A NETWORK OF CONTRACTUAL RELATIONSHIPS (TRANSACTIONS)
  – THE NATURE OF THE TRANSACTIONS DETERMINES THE VERTICAL BOUNDARIES (INDICATES WHETHER TO MAKE OR BUY)
• A WELL-DEVELOPED FIELD OF STUDY
BASIC RULE FOR MAKE-OR-BUY DECISION

• BUY (OUTSOURCE) IF
  INTERNAL COSTS > OUTSOURCED COSTS

• INTERNAL COSTS = PRODUCTION COSTS + "AGENCY" COSTS

• OUTSOURCED COSTS = PRODUCTION COSTS + "TRANSACTION" COSTS
STARTING POINTS

• AGENCY THEORY (including the Principal-Agent Problem)

• TRANSACTIONS COST ECONOMICS (TCE)
  – “VERTICAL” BOUNDARIES OF THE FIRM: what to produce *within firm boundaries*.

• COMPETITIVE SOURCING, e.g., A-76
THE PROMISE OF OUTSOURCING

• LOWER PRODUCTION COSTS IN THE GENERAL MARKETPLACE
  – COMPETITIVE FIRMS ARE HIGHLY EFFICIENT
  – ... AND PASS THOSE RESULTS ON TO THEIR CUSTOMERS (P ≈ MC)

• LESSENING “AGENCY” COSTS
  – REMINDER OF CONTESTABILITY
THE FUNDAMENTAL TRANSFORMATION

• SOME OUTSOURCING RELATIONSHIPS LEAVE THE COMPETITIVE MARKETPLACE

• IN PARTICULAR, RELATION-SPECIFIC INVESTMENTS REMOVE ALTERNATIVE TRADING PARTNERS

➢ STARTING WITH COMPETITIVE BIDDING CAN LEAD TO BILATERAL MONOPOLY AS A RESULT
TCE AND THE PERILS OF OURSOURCING

• TRANSACTIONS COSTS ARISE FROM VARIOUS SOURCES
  – COORDINATING ACTIVITIES
  – SAFEGUARDING SENSITIVE INFORMATION
  – MOTIVATING EFFORTS FOR MUTUAL INTEREST

➤ RISKS TO BOTH PARTIES OF THE RELATIONSHIP
MOTIVATION: Avoiding Opportunistic Behavior & Hold Up

• OPPORTUNISTIC BEHAVIOR: “Self-interest seeking with guile …” (Williamson)
  – Also defined as unproductive bargaining or “rent-seeking” activities.

• HOLDUP: being forced to accept worse terms through renegotiation with a partner who threatens to terminate the relationship.
  ➢ Bilateral bargaining can dissipate or even eliminate any gains from a transaction.
ADDRESSING THE HOLDUP PROBLEM: Benefits & Costs

• WELL-CRAFTED CONTRACTS
  – INCENTIVES
  – ENFORCEMENT
  – “GOVERNANCE” PROVISIONS

• “TAPERED” INTEGRATION
  – STANDBY CAPACITY
  – “GOCO” PHYSICAL ASSETS

➢ COSTLY ACTIONS WHICH DISSIPATE GAINS, BUT STILL LEAVE SOME (ALBEIT LESSENED) RISKS
TCE ISSUES IN ACQUISITION PROJECTS AND HYPOTHESIZED MANIFESTATIONS

Ex Ante Indicators Of High Transactions Cost

COORDINATION & MOTIVATION PROBLEMS

EVENTS DURING THE PROJECT: Cost Overruns Disputes Renegotiations …

PROBABLY NOT DIRECTLY OBSERVEABLE

HIGHER COSTS (Ex Post)
EX ANTE INDICATORS OF TRANSACTIONS COSTS

“STOPLIGHT METHOD”

• ASSET SPECIFICITY
  – **RED**: ONE QUALIFIED SUPPLIER
  – **GREEN**: MANY AVAILABLE SUPPLIERS

• COMPLEXITY
  – **RED**: LARGE SCALE, SPECIALIZED SKILLS
  – **GREEN**: ROUTINE TASK OR STANDARD PRODUCT
EX ANTE INDICATORS II

• LENGTH OF RELATIONSHIP
  – RED: LONG-TERM, HARD TO FORESEE PROBLEMS
  – GREEN: SERIES OF SEPARATE TRANSACTIONS

• FREQUENCY
  – RED: SPECIALIZED TASK WITH SIGNIFICANT LEARNING BY DOING
  – GREEN: ROUTINE, STANDARD TASK. WIDESPREAD LEARNING BY DOING
EX ANTE INDICATORS III

• TIME SENSITIVITY
  – RED: TIMELY, SHORT-FUSED PERFORMANCE HIGHLY IMPORTANT
  – GREEN: NON-TIMELY PERFORMANCE CAUSES INCONVENIENCE

• OPERATIONAL SIGNIFICANCE
  – RED: UNSATISFACTORY PERFORMANCE DEGRADES READINESS OR SAFETY
  – GREEN: UNSATISFACTORY PERFORMANCE CAUSES INCONVENIENCE
Getting Good Data: A Tale of (mostly) Frustration

• **HOW TO MEASURE TRANSACTION COSTS?** *(or what would be a good proxy?)*
  – Program Management Office (PMO) costs
  – Program Management (Contract) costs
Data for Major Acquisition Programs

• Consolidated Acquisition Reporting System (CARS)
  – Includes information from Selected Acquisition Reports (SAR) and Defense Acquisition Executive Summaries (DAES)

• Budget Item Justification sheets
  – OSD budget

• Cost Data Summary Report (DD 1921)
  – Contract WBS elements
Problems with Existing Data I

• SAR and DAES do not contain the level of detail necessary to identify PMO costs
• OSD budget is not consistent in reporting PMO costs across programs and years
• Information in CARS does not always track to OSD budget
  – SAR only includes the six largest active contracts
Problems with Existing Data II

- CDSR (1921) categories are not consistent across programs or contractors
  - Program Management (non-ILS)
  - Program Management (ILS)
  - System Engineering & Program Management (SEMP)
    - System Engineering (Management)
    - Program Management

- Difficult to compare across programs
## Case Studies

### Indicators

<table>
<thead>
<tr>
<th>ATACMS</th>
<th>JAVELIN</th>
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<tr>
<td><strong>Ex Ante:</strong> 1 Red, 2 Yellow, 2 Green</td>
<td><strong>Ex Ante:</strong> 1 Red, 4 Yellow</td>
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### Progress

**ATACMS**
- Consistently on schedule, on budget
- No major issues

**JAVELIN**
- Nunn-McCurdy breach, behind schedule
- Governance issues: renegotiation (cost sharing), “rebaselined”
Case Studies
Cost

ATACMS
Ex Post:
• One source
• 9 CDSRs
  – Most FFP
• SEMP/Total Ratio
  – 0.0858

JAVELIN
Ex Post:
• Two or three sources
• 20 CDSRs
  – Most CP
• SEMP/Total Ratio
  – 0.1629
Notional Analysis

RDTE breaches vs. SEMP ratio

Procurement breaches vs. SEMP ratio
WHAT DATA WOULD WE COLLECT FOR TRANSACTION COSTS?

- MORE STANDARDIZED MEASUREMENT OF TRANSACTION-COST AVOIDANCE MEASURES
- CONTRACT NEGOTIATION AND ADJUDICATION
- TAPERED INTEGRATION
- MONITORING EFFORTS – INCLUDING DT&E
WHAT’S NEXT?

• ADD TO BODY OF CASE STUDIES
  – FOCUS ON *EX ANTE* INDICATORS AND PROGRAM HISTORY VS. *EX POST* COST, SCHEDULE OR PERFORMANCE SHORTCOMINGS

• CONTINUE EXAMINING SEMP RATIO AS INDICATOR OF TRANSACTION COSTS

• RUN A PROTOTYPE CALCULATION OF TRANSACTIONS COST FOR ONE PROGRAM