Transaction Cost Economics (TCE) and Cost Estimation Methodology

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1

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

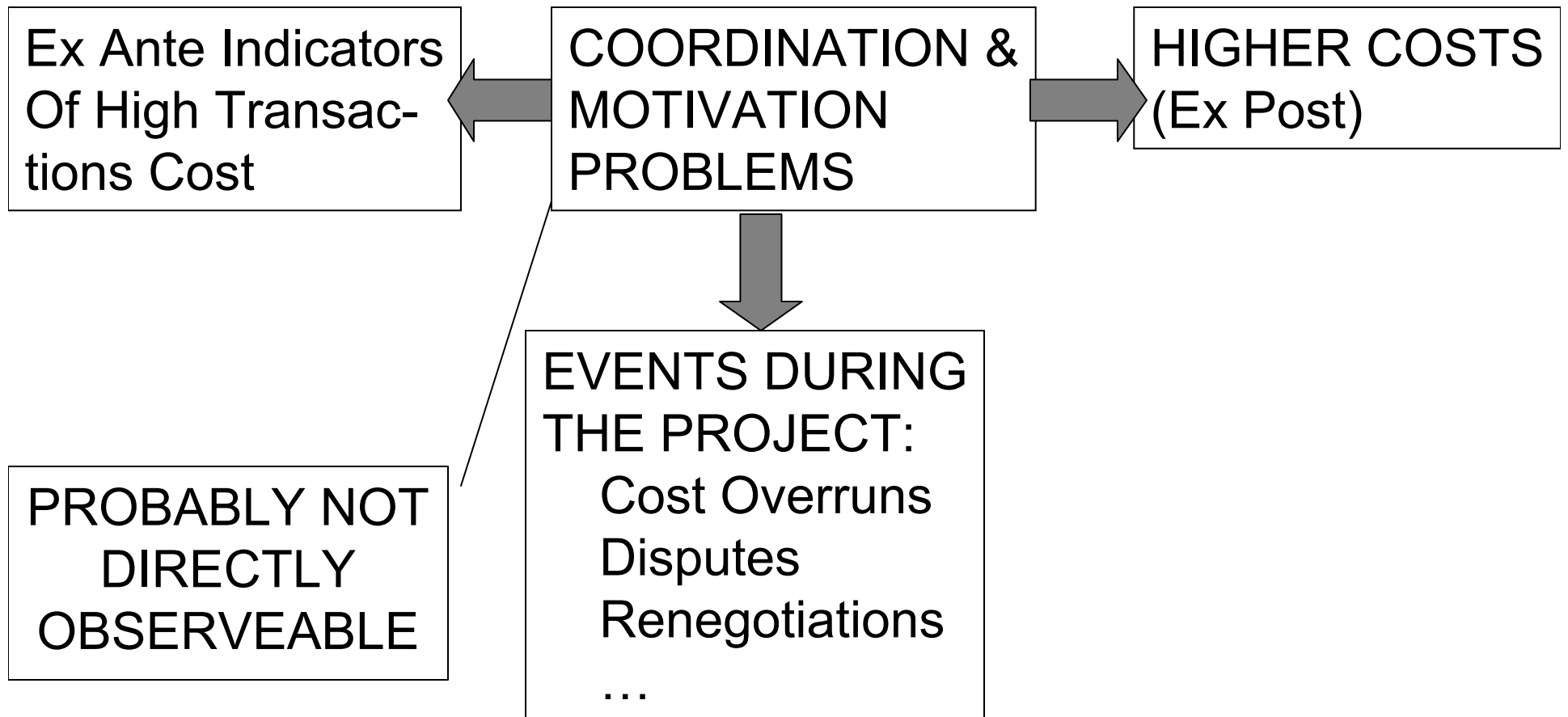- RISKS TO BOTH PARTIES OF THE RELATIONSHIP

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 Transac-tions Cost

COORDINATION & MOTIVATION PROBLEMS

HIGHER COSTS (Ex Post)

PROBABLY NOT DIRECTLY OBSERVEABLE

EVENTS DURING THE PROJECT:
Cost Overruns
Disputes
Renegotiations
…

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

ATACMS

Ex Ante: 1 Red,
            2 Yellow
            2 Green

Progress

- Consistently on schedule, on budget
- No major issues

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Ex Ante: 1 Red,
            4 Yellow

Progress

- Nunn-McCurdy breach, behind schedule
- Governance issues: renegotiation (cost sharing), "rebaselined"

Case Studies
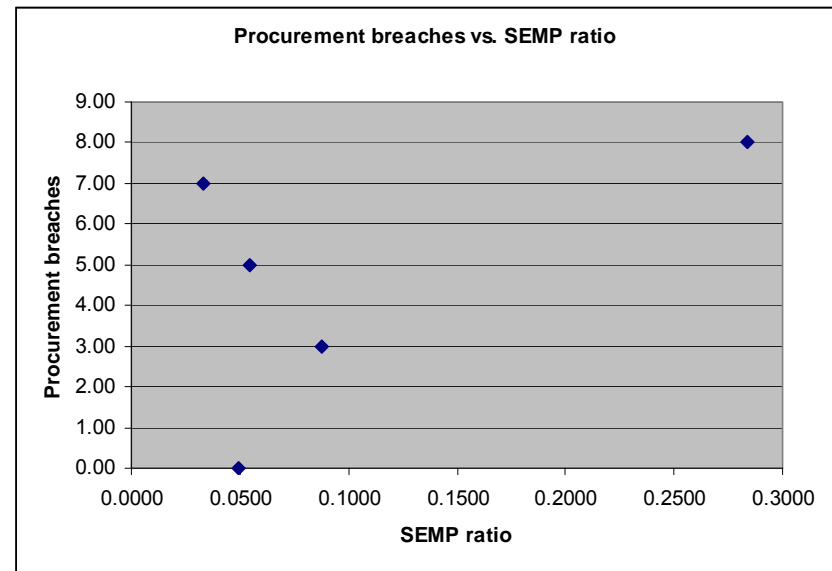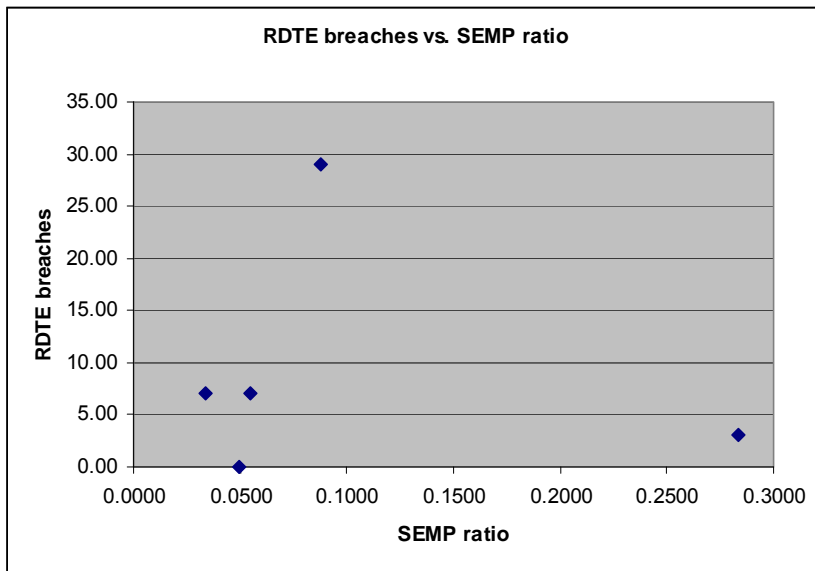## Cost

ATACMS

Ex Post:

- One source

- 9 CDSRs

  – Most FFP

- SEMP/Total Ratio

  – **0.0858**

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Ex Post:

- Two or three sources

- 20 CDSRs

  – Most CP

- SEMP/Total Ratio

  – **0.1629**

Notional Analysis

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