

Transaction Cost Economics (TCE) and Cost Estimation Methodology

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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.
- $\text{Cost} = f(\text{"Production" Costs, Transaction Costs})$
 - Production Costs = $g(\text{WBS, systems integration})$
 - 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 ($P \approx MC$)
- 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

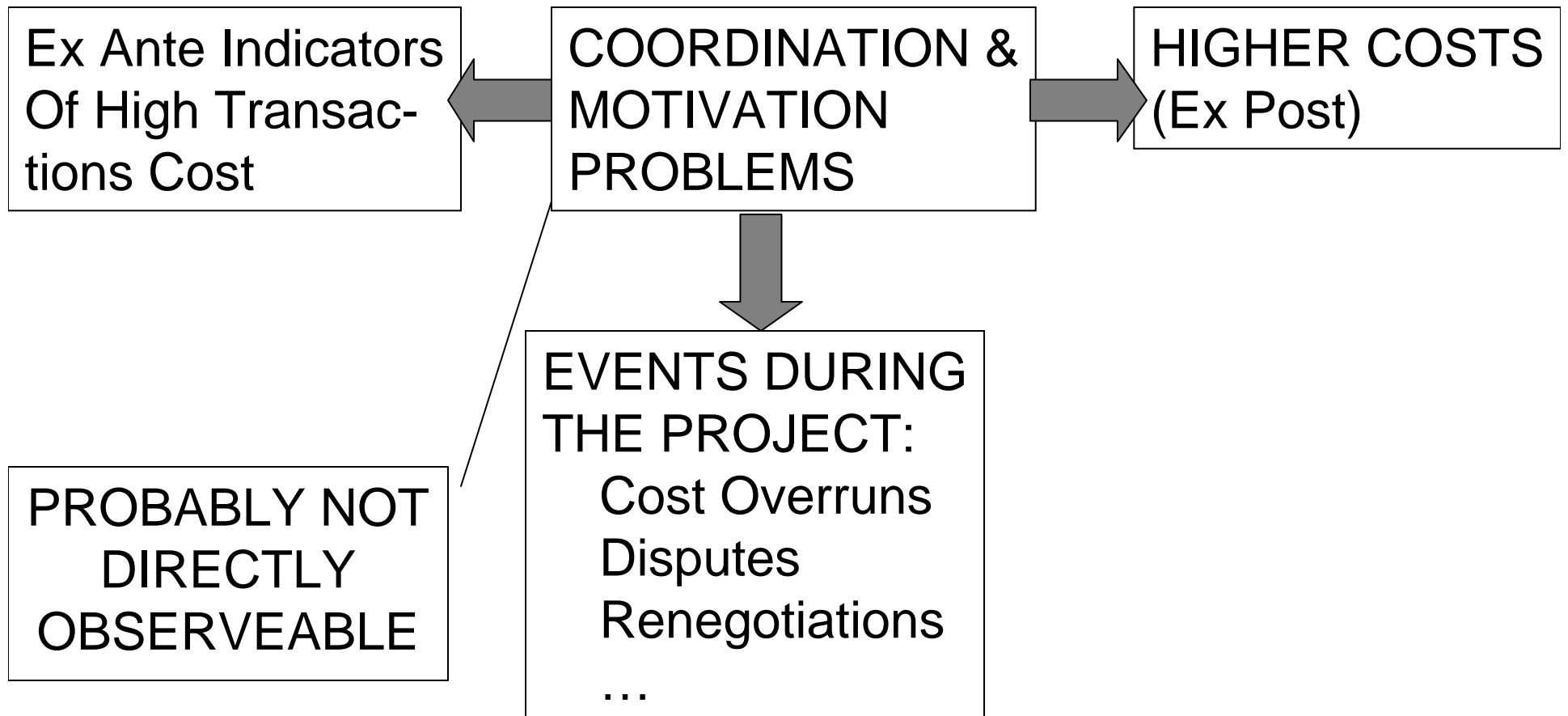
MOTIVATION: Avoiding Opportunistic Behavior & Hold Up

- 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 LESSENERED) RISKS

TCE ISSUES IN ACQUISITION PROJECTS AND HYPOTHESIZED MANIFESTATIONS



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

JAVELIN

Ex Ante: 1 Red,
4 Yellow

Progress

- Nunn-McCurdy breach, behind schedule
- Governance issues: renegotiation (cost sharing), “rebaselined”₂₁

Case Studies

Cost

ATACMS

Ex Post:

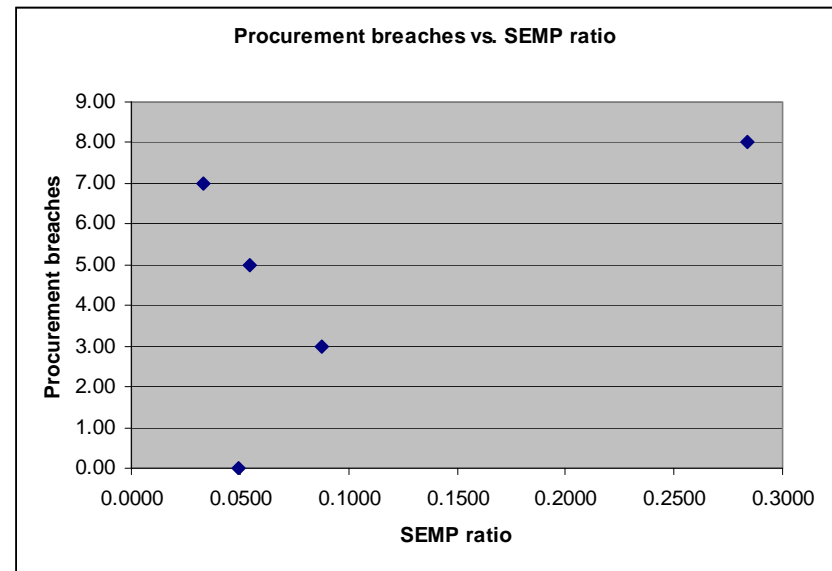
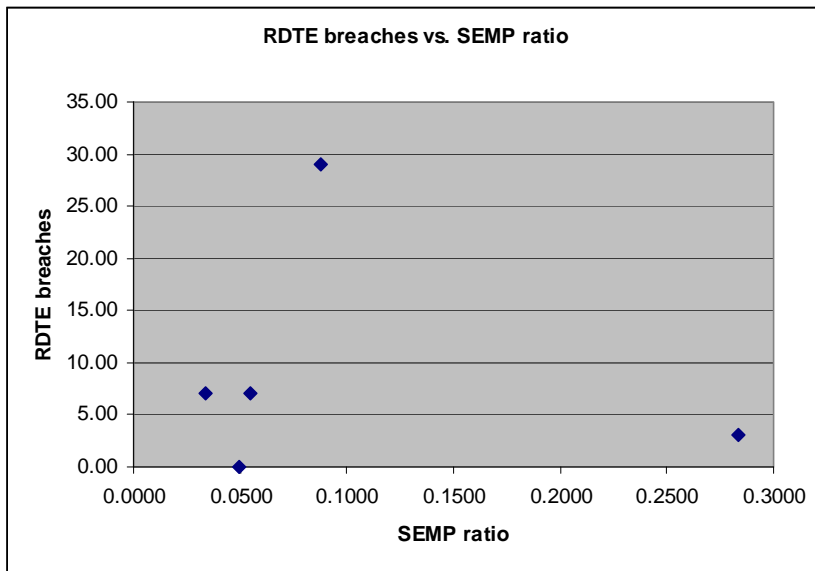
- One source
- 9 CDSRs
 - Most FFP
- SEMP/Total Ratio
 - **0.0858**

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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