

NORTHROP GRUMMAN

DEFINING THE FUTURE

Help or Hype? Estimating the Impact of Reverse Auction on Materials Procurement Cost

Society for Cost Estimating and Analysis
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Perpetual Goal: Cost Reduction/Cost Avoidance

The New York Times

**Pentagon Struggles With
Cost Overruns and Delays**

July 11, 2006

washingtonpost.com

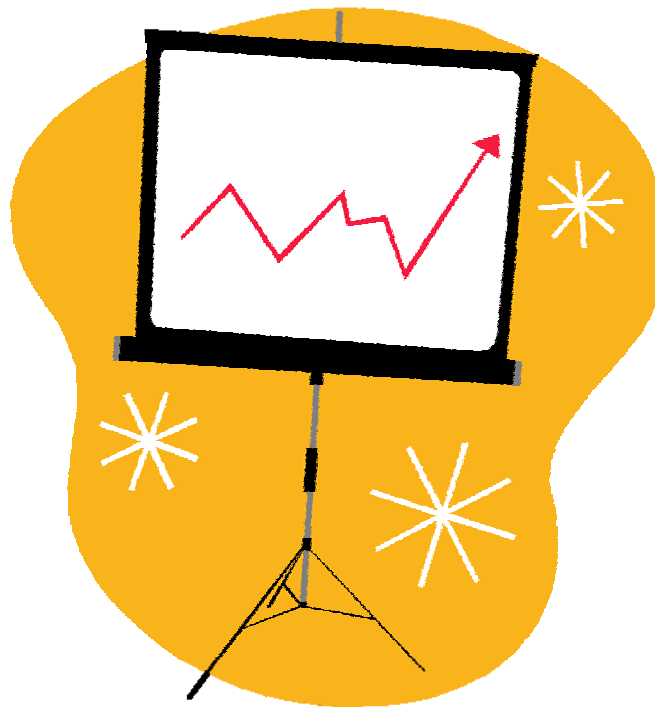
**GAO Blasts Weapons Budget
Cost Overruns Hit \$295 Billion**

April 1, 2008



**Errors in Estimating
Supplies Cause \$12
million VDOT overrun**

October 13, 1998



The New York Times

**Virginia and Maryland
Square Off Over Wilson
Bridge Overruns**

March 3, 2001

The Washington Times

**Largest Metro Fare
Increase in System
History**

January 8, 2008

The Boston Globe

**Big Dig Cost Overruns
Total Nearly \$1.5B**

February 9, 2003

Purchased Materials/Services Represent 55-75% of Cost

Definitions

- “English” or Traditional Auction
 - Similar to auction house or eBay auction
 - Single Seller, Multiple Buyers
 - Buyer is Bidding
 - Cost Increases as Auction Proceeds
 - “Winner” is Highest Bidder
- Reverse Auction
 - Single Buyer, Multiple Sellers
 - Seller Is Bidding Party
 - Cost Decreases as Auction Proceeds
 - “Winner” is Lowest Bidder



History of Reverse Auction

- Glen Meakem, FreeMarkets, Inc.
 - Developed Concept Of Electronic Auctions In 1994 While Working At General Electric
 - GE Management Thought It Was Too Risky
 - Meakem Left To Start His Own Company
 - FreeMarkets, Inc. Started In 1998
- Many Competitors Soon Appeared
 - Corporate: Commerce One, Ariba, E-steel, Metalsite, Plasticsnet.com
 - Government: GSA Advantage, Pentagon E-mall, NAVSEA Seaport.mil, FedBid.com



Which Materials are Suitable for Reverse Auction?

- Commodity Materials and Services
- Items With Multiple Vendors With Established Past Performance Records
- Materials With Well Defined Requirements
- Existing Technologies
- High Margin Items

What Types of Contracts are Suitable?

- Full And Open Competition
- GSA Schedule Buys
- Small Business Set-Asides
- BPA/IDIQ Multiple Award Contracts

How Does Reverse Auction Work?

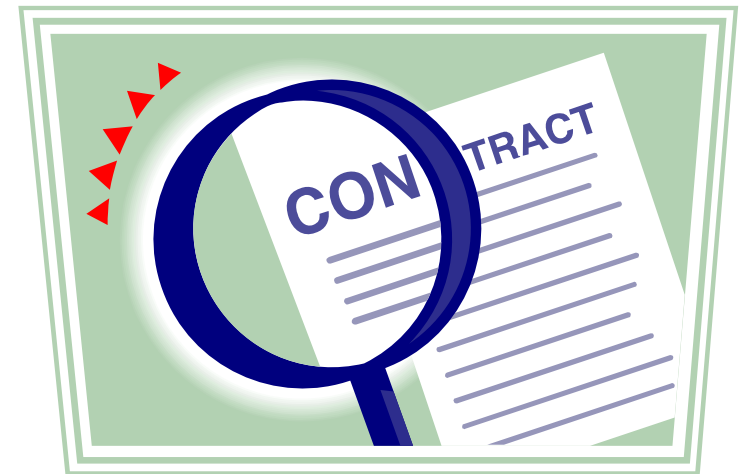
- Pre-approved Bidders List
- Cost Baseline Established from Initial Bids Submitted in Advance
- Electronic or Web-Based Bidding
- Time Limited Bidding Period – usually 20-60 Minutes
- If Bids Come In During Last 60 Seconds or if Bidder Has Been Disconnected, Auction Goes into Overtime
- Bidders See Competitors' Bids in Real Time
- Bidders Can Submit New Bids If Underbid

BIDDERS' IDENTITIES ARE CONCEALED



Finalizing the Sale

- Reverse Auction Results Can Be Final
- OR, Can Be the Starting Point For “Electronically Assisted Negotiations”
- Other Terms Of Sale Can Be Included In Auction Or Negotiated After The Fact
 - Specific Brand Name Equipment
 - Schedule
 - Payment Terms
 - Installation
 - Inventory
 - Technical Support
 - Geographic Area
 - Past Performance
- Inclusion Of Other Metrics Leads To Best Value Results



Legal Challenges to Reverse Auction

- Reverse Auction Was Illegal Until 1977, When FAR Was Changed To Permit It
- Most Comments Received From Industry Groups Opposed The Change
- Lawsuit: Reverse Auction Violates Prohibition Against Revealing Contractor Bid Data.
 - Participants Sign Waivers
 - Government Is Not Revealing Data, Bidders Are Revealing Their Own
 - Bidders Identities Hidden
- Also Determined To Be Legal Under FAR Part 13
 - Part 13 Does Not Prohibit Reverse Auction, And Anything Not Expressly Prohibited Is Permitted.
 - Part 13 Encourages Simplified Procedures Below The Simplified Acquisition Threshold (Under \$100k Or Commercial Items Under \$5 Million)
 - Part 13 Encourages The Use Of “Innovative Procedures”.
 - Part 13 Encourages Electronic Purchasing Techniques By Permitting Electronic Commerce Where Practicable And Cost Effective.

(Source: Thelen, 2005)

Life Cycle of Reverse Auction

- Burst of Popularity and Publicity in Early 2000s
- “Initial Exuberance Has Ebbled” (Schwartz, 2004)
- Some Organizations And Officials Still Uncertain About Whether Reverse Auction Is Legal
- Consolidation Of Reverse Auction Companies In Dot.Com Crash
 - Some Went Out Of Business Or Were Acquired By Others
 - FreeMarkets Bought By Ariba
 - Commerce One Went Out Of Business, Spun Off Aquilent
- Legal Issues With Acceptance of Electronic Signatures Now Resolved

Case Examples

- First FreeMarkets Auction: 1998
 - Customer: United Technologies Corp.
 - Item: Printed Circuit Boards
 - Baseline cost Estimate: \$74M Auction Result \$42M
 - Savings 43%
- US Postal Service: 2000
 - Item: 4600 Mail Trailers
 - Cost Savings 11%
 - Procurement Time Savings 30 days
- State Department (using FedBid): 2005
 - Transactions Using Reverse Auction 1,693
 - Baseline Cost Estimate: \$72.4M Auction Results \$64.6M
 - Savings 11.8%

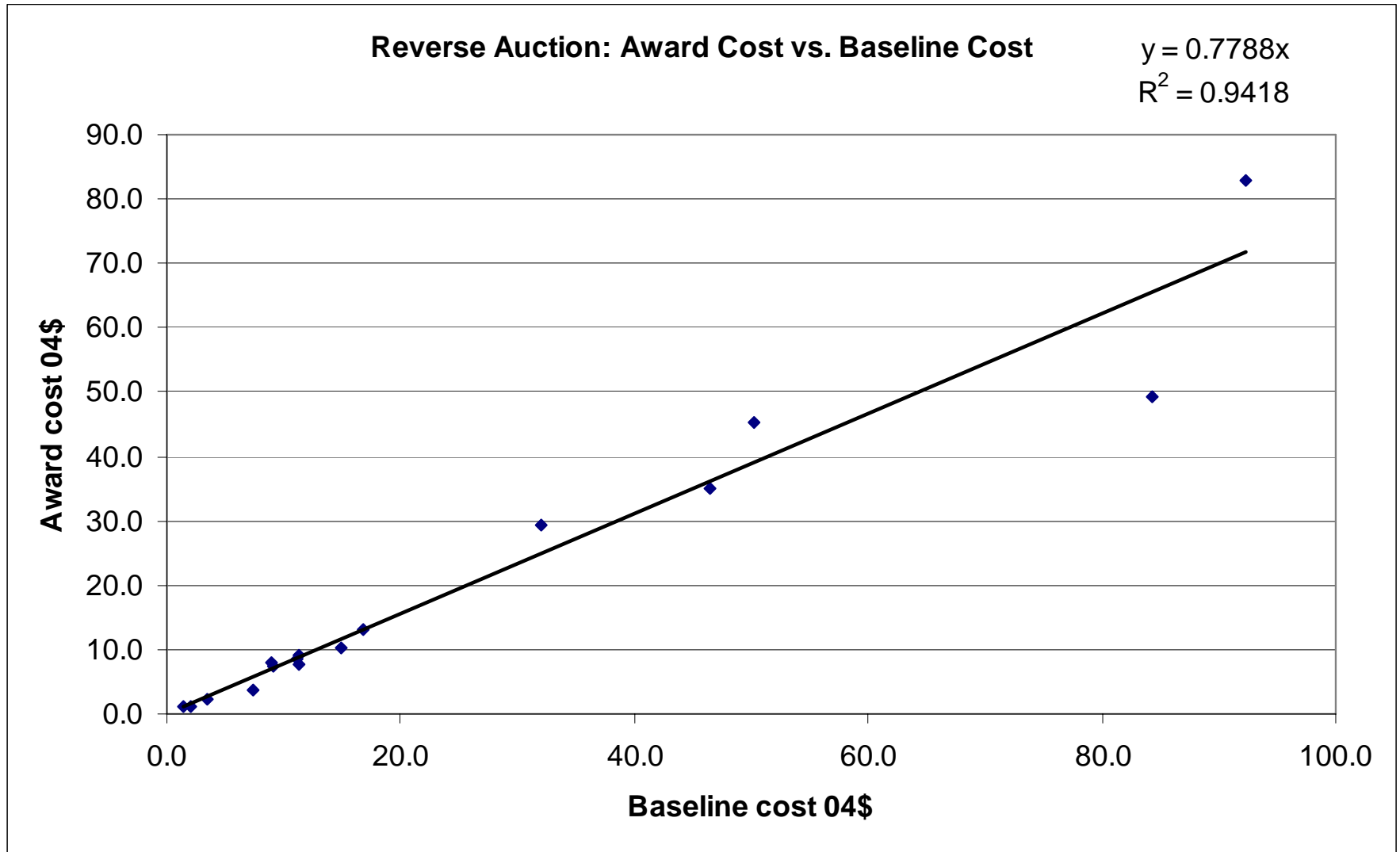
Public Source Database

- Published Reverse Auction Results From 1998 To 2007
- Normalized To 2004 Dollars
- Contract Size Ranges From \$1M To \$90M
- Data Points Included In Database If Baseline And Auction Price Data Available – Omitted If Just Percent Savings Published
- No Information On Contract Type; Assumed Firm Fixed Price
- Buyers Mostly Federal And State Government Agencies

Public Source Database Example

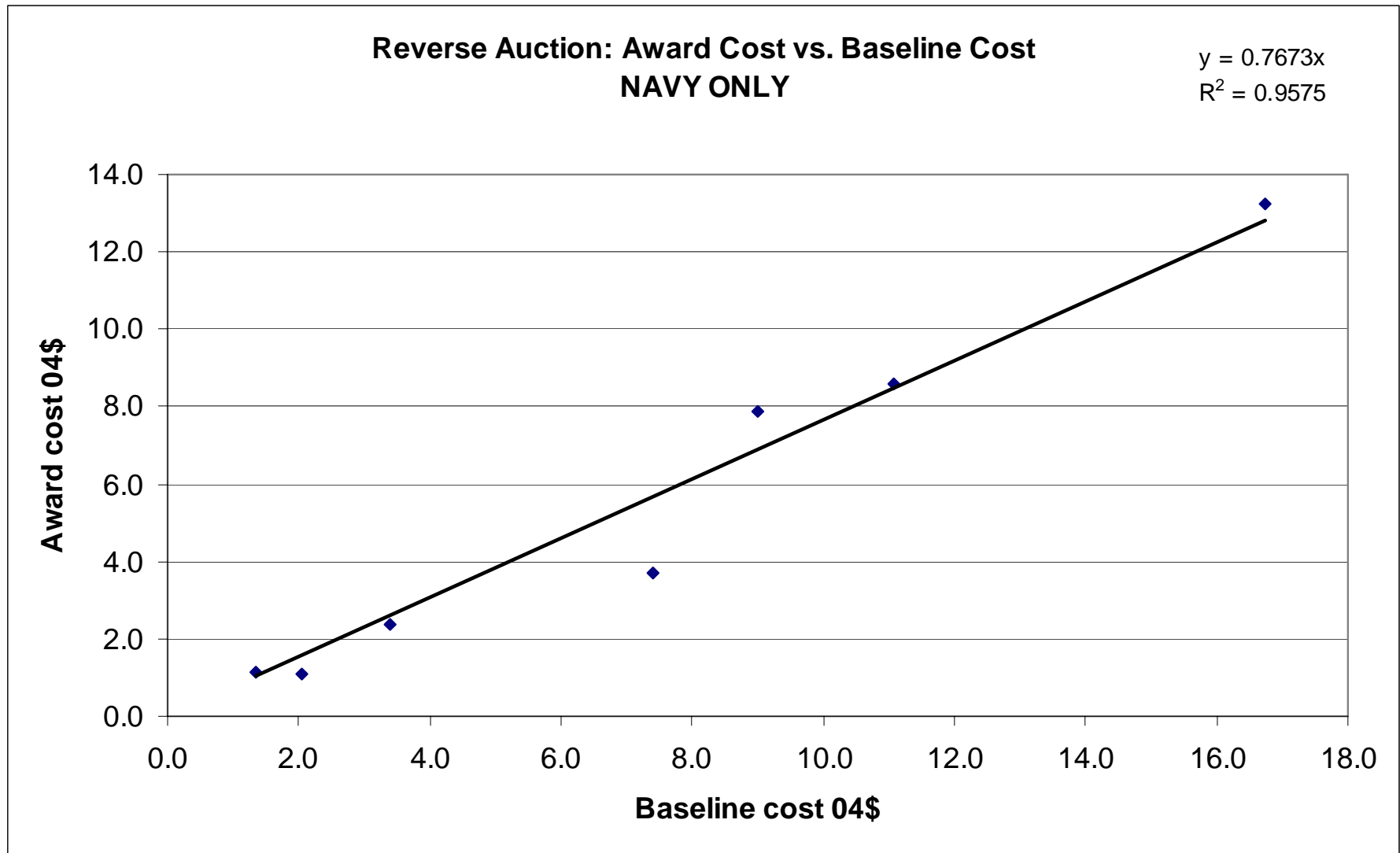
| Buyer | Entry | Sale | 04\$ Entry | 04\$ Sale | Base year | Org |
|-------|-------|--------|------------|-----------|-----------|-------|
| A1 | 41.1 | 30.9 | 46.5 | 34.9 | 2000 | State |
| A2 | 92.3 | 82.9 | 92.3 | 82.9 | 2004 | State |
| A3 | 50.3 | 45.375 | 50.25 | 45.375 | 2004 | State |
| B1 | 72.1 | 42.1 | 84.2 | 49.2 | 1998 | UT |
| C1 | 3.3 | 2.3 | 3.4 | 2.4 | 2003 | Navy |
| C2 | 14.8 | 11.7 | 16.7 | 13.2 | 2000 | Navy |
| C3 | 9.8 | 7.6 | 11.1 | 8.6 | 2000 | Navy |
| C4 | 1.2 | 1.0 | 1.4 | 1.1 | 2000 | Navy |
| C5 | 1.817 | 0.945 | 2.054 | 1.068 | 2000 | Navy |
| C6 | 6.6 | 3.3 | 7.4 | 3.7 | 2000 | Navy |
| C7 | 9.0 | 7.9 | 9.0 | 7.9 | 2004 | Navy |
| D1 | 12.9 | 8.9 | 14.9 | 10.2 | 1999 | PA |
| D2 | 30.0 | 27.5 | 32.1 | 29.4 | 2001 | PA |
| E | 10.0 | 6.9 | 11.3 | 7.8 | 2000 | DFAS |
| F1 | 10.0 | 8.1 | 11.3 | 9.2 | 2000 | CECOM |
| F2 | 8.1 | 6.6 | 9.2 | 7.5 | 2000 | CECOM |

Public Source Results – Complete Data Set



Final Reverse Auction Cost = Baseline Entry Cost * 77.88%

Public Source Results – Navy Data Set



Final Reverse Auction Cost = Baseline Entry Cost * 76.73

Are Reverse Auction Savings Real?

- Not All Reverse Auction Costs Are Captured
- Results Are Typically Stated As Auction Result vs. Baseline Cost = Percent Savings. This omits:
 - Reverse Auction Company Fees
 - Government Agency Fees (ex. GSA 3-5%; SeaPort 7.56% Avg, FedBid 3%)
 - Reverse Auction Software Licensing Costs
 - Personnel Training Costs
 - Website Customization Costs
 - Web Hosting or Private Network Costs
 - System Support
- Costs of Switching from One Supplier to Another
- 2004 GAO Audit Stated That Of \$5.9M Savings Claimed By USPS, \$2.1M Was “Questionable” Because Of Incorrect Baseline Data Or Unsubstantiated Statistical Analysis

Staffing Changes from Reverse Auction

- Conversely, Some Transaction Cost Savings Related to Reverse Auction Are Not Captured Either
- These Indirect Benefits Are More Difficult to Quantify
 - Streamlined Procurement Announcement Process
 - Improved Accuracy
 - Captures Data for Future Cost Forecasting
 - Web Based Communication/Certification of Approved Vendors
 - Automated Bid Documentation
 - Auction Software Captures Processes and Results
 - Procurement Time Reductions Can Mean Less Staff

Examples

EDS/EBreviate 2001

First 3 Auctions Saved a Total of
\$945K, or 52%

\$20,000 Per Event Fee * 3
Auctions

\$60K Total Fee

$\$945K - \$60K =$ Adjusted Savings
of \$885K, or 48%

Navy NAVICP 2002

First 5 Auctions saved a total of
\$14.8M, or 18%

FreeMarkets' \$200K Total Fee for
these 5 auctions does not
reduce savings significantly

However, for large buyers,
FreeMarkets' fee was \$3-4M
per year PLUS a portion of the
savings

Examples of Reverse Auction Fee Structures

- Fixed Fee Per Year
- Fixed Fee Per Auction
- Percentage of Sales
- Percentage of Savings (either alone or in addition to Fixed Fee)
- License Fee Per Seat
- Training Fee Per Seat
- Fixed Costs for Agency or Company-Specific Computer Based Training Scenarios

Criticisms of Reverse Auction

- Abuse/Gaming
 - Companies Bid Not Intending To Win, But Simply To Drive Down Opponents' Profit Margins
 - Despite Anonymous Bidding, May Reveal Competitive Information
 - Auction Companies/Market Makers Invite Low Cost, Low Quality Sellers To Improve Their Compensation (Increase Their Portion Of Savings As Fee)
 - Opportunistic Behavior By Buyers And Sellers
 - Adversarial, "Retaliatory" Pricing On Subsequent Contracts
- Probability That Winning Bidder Actually Cannot Execute At Final Price
- Short Term Focus, No Long Term Relationship Between Seller And Buyer
- Doesn't Address Systemic Problems In Company's Cost Structure, Or Fundamentally Improve Supplier Network
- Reverse Auction Conforms To Misleading/Incorrect Management Metrics

The Emiliani Study

- Dr. M.L. (Bob) Emiliani of Central Connecticut State University
 - BS, MS and PhD in Engineering from Brown University
 - Author of 12 articles over a 10 year study of e-commerce
 - Concludes that Reverse Auction Savings Are Overstated by 50-70%
 - Reverse Auction (Adversarial Buyer/Supplier Relationship) is Counter to Lean Strategies (Cooperative Buyer/Supplier Bond)

Reverse Auction Conclusions

- Reverse Auction/e-Commerce Is A Useful Cost Reduction and Process Streamlining Tool
- Published Reverse Auction Savings Data Should Be Used With Caution
- Evaluate Reverse Auction Data With Total Ownership Cost Mindset
 - Ensure That Support Costs and Fees Are Captured
 - Avoid Overstating Savings
- Although Press Coverage Cites Double Digit Savings, Over Time Most Long Term Results Are In the 6-10% Range