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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

LPTA VERSUS TRADEOFF: ANALYSIS OF CONTRACT SOURCE SELECTION STRATEGIES AND PERFORMANCE OUTCOMES

June 2016

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**LPTA VERSUS TRADEOFF: ANALYSIS OF CONTRACT SOURCE
SELECTION STRATEGIES AND PERFORMANCE OUTCOMES**

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Submitted in partial fulfillment of the requirements for the degree of

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from the

**NAVAL POSTGRADUATE SCHOOL
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LPTA VERSUS TRADEOFF: ANALYSIS OF CONTRACT SOURCE SELECTION STRATEGIES AND PERFORMANCE OUTCOMES

ABSTRACT

The Department of Defense (DOD) spends hundreds of billions of dollars annually to procure highly complex weapon systems, supplies, and services. Due to recent budget constraints, DOD stakeholders are closely examining the strategies and methodologies contracting professionals employ to acquire what the DOD needs. Contracting professionals may use lowest price technically acceptable (LPTA) and tradeoff strategies to procure requirements to maximize the overall best value to the government.

The purpose of this research is to determine if a relationship exists between the contract source selection strategy employed, either LPTA or tradeoff, and the contract pre-award and post-award performance metrics. Data were collected from contract files located at Naval Sea Systems Command to determine the potential relationship between LPTA and tradeoff performance metrics. The findings of this research suggest that not enough data were collected to answer the research questions. However, the data contained in this report will be incorporated into a pool of data gathered from previous research efforts to provide adequate statistical power to answer the research questions. The report concludes with recommendations for further research.

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LIST OF ACRONYMS AND ABBREVIATIONS

ANCOVA	analysis of covariance
ASN	assistant secretary of the Navy
BBP	Better Buying Power
C4I	command, control, communications, computers, and intelligence
CICA	Competition in Contracting Act
CPARS	Contractor Performance Assessment Reporting Systems
CPIC	Contract Policy and International Contracting
DAE	Defense Acquisition Executive
DAR	Defense Acquisition Review Council
DARS	Defense Acquisition Regulations System
DAU	Defense Acquisition University
DFARS	Defense Federal Acquisition Regulation Supplement
DOD	Department of Defense
DPAP	defense procurement and acquisition policy
DRPM	direct reporting program managers
DV	decision variable
EVM	earned value management
FAR	Federal Acquisition Regulation
FARA	Federal Acquisition Reform Act
FASA	Federal Acquisition Streamlining Act
GAO	Government Accountability Office
HTRO	highest technically rated offeror
IV	independent variable
LPTA	lowest price technically acceptable
LPTATO	LPTA or tradeoff
MANCOVA	multivariate analysis of covariance
MDA	Milestone Decision Authority
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command

NAVSEA	Naval Sea Systems Command
NAWC	Naval Air Warfare Center
NSWC	Naval Surface Warfare Center
NUMEVALFACTORS	number of evaluation factors
NUMOFFERS	number of offers
NUMREVIEWS	number of reviews
NUWC	Naval Undersea Warfare Center
OSD	Office of the Secretary of Defense
PARCA	performance assessment and root cause analysis
PALT	procurement administrative lead-time
PEO	program executive officer
RDA	Research, Development, and Acquisition
RFI	request for information
RFP	request for proposal
SAE	senior acquisition executive
SBA	Small Business Act
SOO	statement of objectives
SOW	statement of work
SPAWAR	Space and Naval Warfare Systems Command
SSA	source selection authority
SSAC	Source Selection Advisory Council
SSB	source selection board
SYSCOM	Systems Command
TINA	Truth in Negotiation Act
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology, and Logistics

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I. INTRODUCTION

Department of Defense (DOD) spending is the largest portion of the federal government's discretionary budget and, according to the Brookings Institution, accounts for nearly 3% of the United States' gross domestic production. DOD requirements extend deep into the vast and diverse American economy, and its procurement for goods constitutes nearly 5% of the country's total manufacturing output and up to 20% of U.S. research and development expenditures (O'Hanlon, 2015). In 2013, the DOD procured more than \$300 billion in goods and services, a sum larger than the gross domestic product of many other countries (Government Accountability Office [GAO], 2014). The individuals responsible for procuring these items are DOD contracting professionals. Contracting professionals are charged with procuring the right services or items for the right price, at the right time, in keeping with the public's confidence and in accordance with public policy goals (Federal Acquisition Regulation [FAR], 2016). In recent years, with a tightening DOD budget, DOD stakeholders are scrutinizing the strategies and methods used to procure what the DOD needs. Anticipating an era of lower budgets, the DOD released its Better Buying Power (BBP) initiative—the goal of which was to encourage defense professionals to do more with less and to focus on ways to become more efficient in their procurement efforts (Kendall, 2012). Contracting professionals are expected to employ procurement strategies to purchase requirements at best value to maximize the overall benefit to the DOD. The FAR provides guidelines to aid contracting professionals to attain the best value: lowest price technically acceptable (LPTA) and tradeoff source selection strategies. Contracting professionals may use LPTA if the requirements are well-defined and if contract outcomes are certain. On the other hand, contracting professionals may use a tradeoff strategy to leverage the trade space among schedule, cost, and performance. Ultimately, the employment of the correct best value approach will support the BBP initiative's goal of maximizing efficiency and reducing costs through industry competition and innovation (FAR, 2016).

A. PURPOSE

The purpose of this research is to determine whether a relationship exists between the contract source selection strategy used, LPTA or tradeoff, and the contract pre-award and post-award performance metrics. We address the following metrics: procurement administrative lead-time (PALT), contractor performance ratings, and earned value management (EVM) data to show how efficiently contractors are performing work within budgeted and scheduled constraints. Our intent is to provide contracting professionals with relevant and reliable information to assist in selecting source selection strategies.

B. RESEARCH QUESTIONS

This research intends to answer the following questions:

- How does the source selection strategy affect pre-award metrics (e.g., PALT, number of solicitation amendments or protests)?
- How does the source selection strategy affect post-award ratings (Contractor Performance Assessment Reporting System [CPARS] and EVM performance metrics)?

C. METHODOLOGY

The research methodology incorporates a literature review, data collection, data analysis, and discussion of our findings. The literature review discusses procurement statutes and regulations, the contract management process, source selection strategies, and a review of investigative reports, defense industry perspectives, and ongoing debates regarding source selection strategies. We will review as many contract files as possible in a four-day period. The scope of review will be limited to Navy contracts awarded from 2009–2015 and managed by Naval Sea Systems Command (NAVSEA), located at the Navy Yard in Washington, DC. We will review only contracts that employ LPTA or tradeoff strategies using FAR Part 15. We intend to collect data from contracts exceeding \$1 million to trigger reporting in the CPARS. For contracts that employ a tradeoff strategy, we investigate award criteria to determine the most important award criteria selected.

D. BENEFITS

The findings of this research can inform contracting professionals of the potential economic, performance, and schedule consequences of employing a particular source selection strategy. The benefit of conducting this research is to encourage contracting professionals to pursue a strategy that favors and maximizes efficiency and productivity in military procurement (Kendall, 2012). This research, in conjunction with prior and future projects of similar scope and purpose, could serve as a complement to and expansion of the DOD's BBP efforts to maximize best value when procuring goods and services.

E. LIMITATIONS

The time allotted to review contract files, insufficient sample size, complexity and organization of contract files, and access to pertinent data are all key limitations to the project's research. We were allocated four days to review as many contract files as possible. Due to time constraints, we collected data from a relatively small sample size of 25 contracts. We were not afforded additional time, which would have allowed us to collect data from a larger sample size. Due to the complexity of some contract files, we spent additional time examining several volumes of documents associated with one contract to locate essential data. Furthermore, not all contract files contained a contract file checklist, which impeded our efforts to review files in a timely manner. Contract files that incorporated a checklist helped us to streamline our review and to collect data efficiently. Access to data, specifically CPARS and EVM, posed a significant limitation to the project. In order to access CPARS data, we were required to sign non-disclosure agreements with program offices managing specific contracts. Additionally, EVM data is located in a central repository managed by the DOD's Performance Assessment and Root Cause Analysis (PARCA) office. In order to access EVM data through PARCA's database, we were required to submit an application and request permission. The significant amount of time between submission of the application and access to the database limited our ability to collect EVM data in a timely manner.

F. ORGANIZATION

This report is organized into five chapters. Chapter II is a literature review that addresses the contract management process, source selection strategies, investigative reports, industry perspectives, and ongoing debates regarding source selection strategies. Chapter III explores the organization and responsibilities of DOD acquisition organizations, Navy acquisition organizations, and NAVSEA. Chapter IV provides a description of the data collected, data analysis, and findings. Chapter V presents conclusions and recommendations for further research.

G. SUMMARY

Chapter I introduced the research topic and highlighted the purpose of the research, research questions, methodology, benefits and limitations of the research, and the organization of the report. The next chapter provides a literature review of the procurement statutes and regulations relevant to the contracting process, the contract management process, source selection strategies, investigative reports, industry perspectives, and the ongoing debate regarding source selection strategies.

II. LITERATURE REVIEW

This chapter discusses the elements of the contract management process and examines relevant procurement statutes and regulations, and the ongoing debate regarding source selection strategies.

A. PROCUREMENT STATUTES AND REGULATIONS

The vision of the Federal Acquisition System is to “deliver on a timely basis the best value product or service to the customer, while maintaining the public’s trust and fulfilling public policy objective” (FAR 1.102). To support the federal acquisition system’s policy objectives, the FAR addresses or implements nearly every acquisition policy or statute that governs how the federal government conducts procurement activities.

For example, the Buy American Act of 1933 requires the federal government to procure supplies, construction material, and manufactured goods from American suppliers. The intent of the statute is to give preferential treatment in the distribution of funds to domestic suppliers. However, a procurement officer may acquire foreign products if it is in the public’s interest or if the item is unavailable in sufficient quantity and quality in the United States (FAR, 2016).

The Small Business Act of 1953 created the Small Business Administration (SBA), an independent agency designed to assist and advise small business owners. The SBA provides an array of services and is the lead advocate for small business participation in federal contracting. The Small Business Act requires “contracting officers to ensure that a fair portion of government contracts in each industry category are placed with small businesses” (FAR 19.502).

The Competition in Contracting Act (CICA) of 1984 mandates that the federal government promote and provide for full and open competition prior to entering into a contractual agreement. The FAR requires contracting officers to “provide for full and open competition through use of the competitive procedure such as sealed bids, competitive proposals, combination of competitive procedures, or other competitive

procedures ” (FAR 6.102). If contracts are not entered into competitively, they must meet one of the seven exemptions outlined in the FAR:

- Only one adequate source
- Unusual or compelling urgency
- Mobilization of the industrial base
- International agreements or treaties
- Authorized or required by statute
- National security
- Public interest

The Truthful Cost and Pricing Data Act, formerly the Truth in Negotiations Act (TINA), was passed in 1962 and has been most recently amended by the 1987 DOD Authorization and Appropriations Act (Calhoun & Sybert, 2012). In the absence of competition, the Truthful Cost and Pricing Data Act allows the government to obtain certified cost or pricing data from a contractor. Certified cost or pricing data allows the government to conduct an independent cost analysis to determine fair and reasonable pricing. However, the Truthful Cost and Pricing Data Act does not apply to commercial items, prices set by law or regulations, contracts sought when adequate price competition exists, or contracts at or below the simplified acquisition threshold of \$750,000 (FAR, 2016).

The Federal Acquisition Streamlining Act (FASA) of 1994 and Federal Acquisition Reform Act (FARA) of 1996 sought to reform the federal government’s acquisition system and streamline procurement functions. The Clinton administration wanted to downsize the federal acquisition workforce and lower procurement obstacles by expanding the definition and use of commercial items. Items could be categorized as commercial if technology was still evolving or if the item could be sold to the general public in time to satisfy the government’s requirement. The FASA and FARA also placed considerable emphasis on conducting market research and commercial item procurements and looked to gain efficiencies through low-value, high-volume procurement transactions. The FASA “signaled a dramatic change in acquisition policy and shifted

source selection strategies to be made on a best value basis and not the lowest price” (Office of the Secretary of Defense for Acquisition, Technology, and Logistics [OSD(AT&L)], 2016, p. iv). The best value continuum allows contracting professionals to consider non-price factors, such as past performance, during source selections. FASA also expanded opportunities for small disadvantaged businesses and woman-owned businesses by mandating that 5% of contracts be awarded to small, disadvantaged businesses and 5% to small, woman-owned businesses (Cohen Seglias. n.d.).

The origins of the FAR can be traced back to the Armed Services Procurement Regulation of 1947; however, it was not until 1984 that the FAR was codified in Title 48 of the Code of Federal Regulations. The FAR was implemented by Congress to standardize acquisition policy across the federal government and to eliminate agency specific procurement procedures (FindLaw,2016). The FAR directs the acquisition process by which the federal government purchases products or services through contracting. Contracting is defined by the FAR as a means of “purchasing, renting, leasing, or otherwise obtaining supplies or services from nonfederal sources. Contracting includes description (but not determination) of supplies and services required, selection and solicitation of sources, preparation and award of contracts, and all phases of contract administration” (FAR 2.101). The contract management process is governed by the FAR and is discussed in greater detail in the following section.

B. CONTRACT MANAGEMENT PROCESS

The FAR defines a contract as “a mutually binding legal relationship obligating the seller to furnish the supplies or services and the buyer to pay for them” (FAR 2.101). The key term in this definition when trying to understand the significance of the contract management process is *relationship*. This relationship begins before the contract is even awarded. When developing and executing a contract, the government and its prospective business partners encounter risk and uncertainty. The management and avoidance of that associated risk and uncertainty is one of the primary purposes for contract management. In most cases, risk cannot be completely removed from the process, but with a sound risk management plan and communication between government and offeror, the risk can be

managed. It is mutually beneficial to both government and offeror to act together in this effort. It is also challenging though, as the ultimate objective of the government is the responsible use of public funds, while the ultimate objective of the offeror is to maximize profits (Wright, 2007). The contract management process serves to balance those conflicting objectives while managing the risk associated for both parties. It is a multi-faceted process demanding technical, risk management, financial, and communication skills that Garrett (2007) appropriately describes as “the art and science of managing a contractual agreement” (p. 18). Garrett breaks this process up into three phases, which he calls pre-award, award, and post-award. The pre-award phase for the government includes procurement planning, solicitation planning, and solicitation. In addition, for the prospective contractors, it includes pre-sales activity, the decision to bid or not, and bid or proposal preparation. The award phase includes source selection for the government and contract formation for the contractor. Finally, the post-award phase includes contract administration and contract closeout or termination for both the government and the contractor. Figure 1 displays this breakdown. Each of the three phases and their associated steps are described in detail in the following sections.

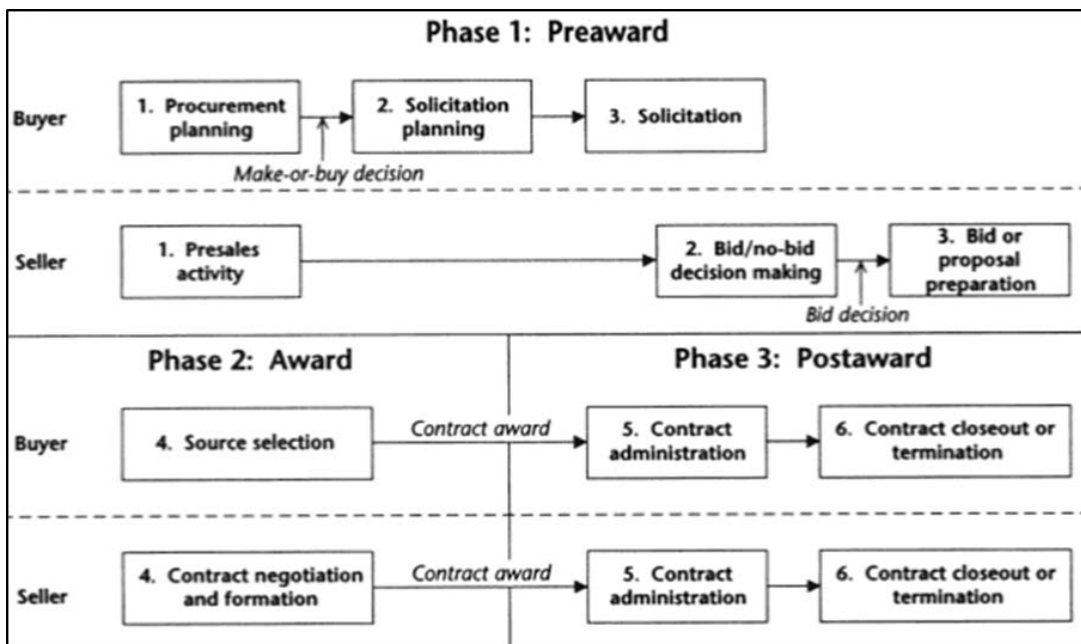


Figure 1. Contract Management Process. Source: Garrett (2007).

1. Pre-Award Phase

The pre-award phase is critical to the success of a contract. During this phase, the government identifies its requirement and then determines how the acquisition team can satisfy that requirement. Critical issues such as cost, schedule, and technical requirements are developed by the government and then communicated to industry during this phase. The success and precision of that communication is essential to not only the prospective contractors' understanding of the requirement, but also in their decision to develop a proposal and in the accuracy and completeness of that proposal (Garrett & Parrott, 2007).

a. Procurement Planning

Procurement planning begins the contract management process. Before a contract can be awarded, the government must identify a requirement. This requirement finds its roots in what Garrett (2007) calls the “make-or-buy” decision. Simply stated, this is the decision for the government to fulfill all or part of that requirement utilizing government resources, capabilities, and manpower, or to outsource all or part of that requirement to a commercial organization. The government must then further develop and refine that requirement into a statement of need, technical and schedule requirements, cost goals, and capability and performance thresholds (Garrett & Parrott, 2007). Once the requirement is fully defined, market research must be conducted to determine industry capabilities. Market research is a critical step in managing the risk of the entire contract management process. It provides a snapshot of who in the industry may have the capability to meet the requirement, if there is already a commercial item available to meet the requirement, and information useful for cost estimation (Wright, 2007). FAR Part 10 directs government contracting professionals to conduct market research and identify potential sources in an effort to promote full and open competition.

In an effort to “identify and resolve concerns regarding the acquisition strategy, including proposed contract type, terms and conditions, and acquisition planning schedules as well as the feasibility of the requirement, and any other industry concerns or questions,” FAR Part 15 encourages government agencies “to promote early exchanges of information about future acquisitions” (FAR 15.201). These early exchanges can be

accomplished through industry “days”/conferences, pre-solicitation notices, requests for information (RFIs), and other means. In determining the type of contract to use, the associated costs, schedule, and performance risks must be considered. Figure 2 shows the relationship between risk and contract type (Garrett, 2007). The complexity of the requirement is often a large factor in determining the appropriate type of contract and associated share of risk the government should take on. For example, if the government requirement is a non-developmental commercial item, the government should award a firm fixed price contract and place the majority of the risk on the contractor. On the other hand, if the government requirement is to develop a new weapon system with no technological precedent, it may be necessary for the government to share or even take on the majority of the associated risk through the use of a cost type contract.

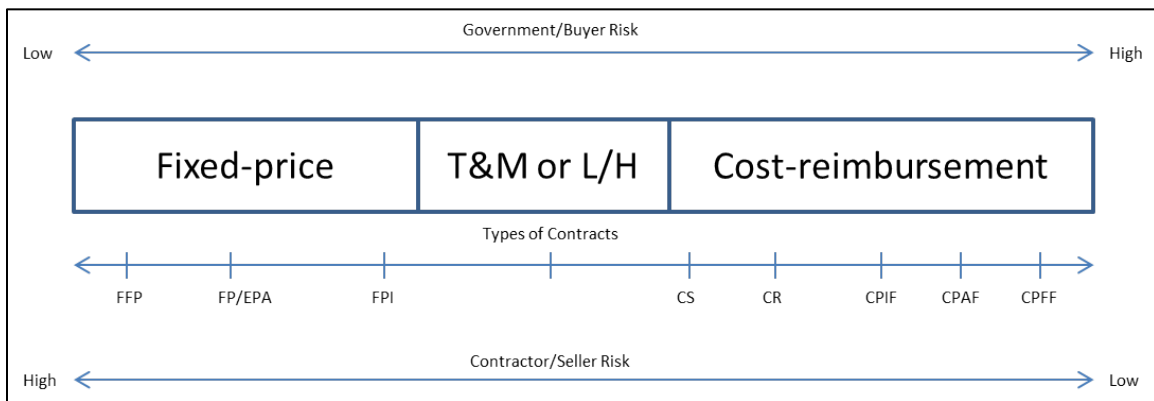


Figure 2. Contract Types and Associated Risk. Adapted from Garrett (2007).

Development of the requirement and analysis of market research ultimately determines the direction for the rest of the contract management process. The choice to use full and open competition or sole source, to procure a commercial item or require the use of military specifications, and to make the contract fixed price or cost type, as well as the choice of source selection strategy, all have their origins in the analysis of the requirement and market research. Procurement planning lays the foundation for the rest of the contract management process.

b. Solicitation Planning

Once the government fully understands its requirements and the industry conditions and capabilities, it must prepare the document that communicates those requirements to industry. This is done through the use of a procurement document, or more specifically a request for proposal (RFP) under FAR Part 15. The RFP includes the statement of work (SOW), and the terms and conditions, and directs the offeror on how to respond to the RFP. Garrett (2007) highlights,

Procurement documents should be structured to facilitate accurate and complete responses from prospective sellers ... and they should be rigorous enough to ensure consistent, comparable responses but flexible enough to allow consideration of seller suggestions for better ways to satisfy the requirements. (pp. 89–90)

The government generally establishes the evaluation criteria on which all offerors' responses will be rated during this step as well (Garrett, 2007).

c. Solicitation

FAR Part 2.101 defines a solicitation as “any request to submit offers or quotations to the Government.” During this step, the government releases its requirement to industry in an effort to receive multiple competitive proposals. It does so through the use of an electronic portal called Federal Business Opportunities (FedBizOpps). FedBizOpps is a single government-wide point of entry for all federal government opportunities over \$25,000 (Nash, Schooner, O’Brien-DeBakey, & Edwards, 2007). The portal allows all potential offerors from industry to view federal requirements and determine if they have the capability and desire to meet them. Garrett (2007) emphasizes the importance of the solicitation communicating the requirements of the government clearly. A failure to do so often results in “delays, confusion, fewer bids or proposals, and lower quality responses” (Garrett, 2007, pp. 24–25). The use of integrated project teams, comprised of multiple senior representatives from each functional department, is a technique Garrett (2007) recommends in ensuring the government’s requirements are clearly and completely articulated. In some cases, the government may simply choose to provide a statement of objectives (SOO), rather than define how to meet requirements

using an SOW, and request the prospective contractors to propose their recommendation to meet those objectives within the constraints provided (Garrett & Parrott, 2007). In this step, it is also important for the government to ensure it has not included terms and conditions, unrealistic delivery dates, or other constraints that make the solicitation undesirable to potential offerors. Minimizing constraints encourages maximum competition and reduces the risk of not receiving a proposal or bid and delaying the acquisition process (Wright, 2007). Ultimately, the desired outcome of the solicitation is to receive several competitive proposals that can then be evaluated based upon the source selection strategy developed during procurement planning. The award phase and source selection are discussed in detail in the following section.

2. Award Phase

During the award phase, acquisition officials must select the offer that presents the best value to the government. The source selection process can be as simple as choosing the lowest priced offer that meets all technical specifications or as in depth as evaluating each proposal based upon multiple evaluation criteria. This process includes the negotiation of contract terms and conditions to be included into the awarded contract. The award phase is of critical importance to the contract management process as it determines the government's business partner for the remaining duration of the process and establishes the ultimate source of the government's requirement (Garrett, 2007).

a. Source Selection

The Source Selection Authority (SSA), with assistance from the Source Selection Advisory Council (SSAC) and the Source Selection Board (SSB), is responsible for selecting the source that offers the best value to the government. FAR 15.303 states that "the contracting officer is designated as the source selection authority, unless the agency head appoints another individual for a particular acquisition or group of acquisitions." The SSA appoints senior government personnel to the SSAC and SSB to advise on the conduct of the source selection process and oversee the evaluation of proposals submitted (Nash et al., 2007). This collective group is often referred to as the source selection team. FAR 15.304 states that

the award decision is based on evaluation factors and significant sub-factors that are tailored to the acquisition. Those evaluation factors and significant sub-factors must represent the key areas of importance and emphasis to be considered in the source selection decision and support meaningful comparison and discrimination between and among competing proposals.

It goes on to state that agency acquisition officials review evaluation factors and determine their relative significance, but that “price or cost to the Government shall be evaluated in every source selection ... and the quality of the product or service shall be addressed in every source selection through consideration of one or more non-cost evaluation factors” (FAR 15.304). Wright (2007) says there are two associated risks during the source selection process: proposal risk and performance risk. Proposal risk is the risk associated with how the contractor is proposing to meet the requirement. The government source selection team must evaluate each contractor’s technical approach to determine the associated level of risk with each proposal. Performance risk is the analysis of each contractor’s ability to meet the requirements of the contract based upon the contractor’s capabilities and evidenced by previous jobs of a similar scope (Wright, 2007). The criteria evaluated are unique to each procurement, and it is the responsibility of agency acquisition officials to ensure the source selection criteria chosen provide a shelter for the government from unnecessary or unforeseen risks.

As mentioned previously, FAR 15.304 requires that price or cost is an evaluation factor in all procurements, regardless of the source selection strategy chosen. In evaluating cost or price, FAR 15.305 stipulates the following:

Normally, competition establishes price reasonableness. Therefore, when contracting on a firm-fixed-price or fixed-price with economic price adjustment basis, comparison of the proposed prices will usually satisfy the requirement to perform a price analysis, and a cost analysis need not be performed. In limited situations, a cost analysis may be appropriate to establish reasonableness of the otherwise successful offeror’s price. When contracting on a cost-reimbursement basis, evaluations shall include a cost realism analysis to determine what the Government should realistically expect to pay for the proposed effort, the offeror’s understanding of the work, and the offeror’s ability to perform the contract.

As directed by the FAR, each proposal's price is evaluated based on realism and competitiveness. Price realism determines if a proposal is priced too low to realistically achieve the requirements of the contract. Cost competitiveness determines if the proposed costs are unnecessarily high. Cost competitiveness is evaluated simply by looking at each proposed price against other competitive proposals, comparable commercial options, and other pricing information (Garrett, 2007).

Price analysis, as FAR Part 15 suggests, is fairly straightforward, especially when multiple competitive offers are received. Price analysis can also be conducted using historical prices from previous procurements, parametric data, published prices, independent government cost estimates, and market research (FAR, 2016).

Cost realism analysis is much more in depth than price analysis and is performed with the goal of determining the probable cost for each offeror based upon each offeror's proposed cost in a cost type contract. FAR 15.404 further describes cost realism analysis as

the process of independently reviewing and evaluating specific elements of each offeror's proposed cost estimate to determine whether the estimated proposed cost elements are realistic for the work to be performed; reflect a clear understanding of the requirements; and are consistent with the unique methods of performance and materials described in the offeror's technical proposal.

FAR 15.404 goes on to state that cost realism analysis can be used in certain circumstances to evaluate fixed price contracts as well. Nash, Cibinic, and O'Brien (1999) clarify, though, that

although the FAR refers to this process as cost realism analysis, greater clarity is achieved by calling it "price realism analysis." This signifies that such analysis cannot be used to adjust the offered prices but may only be used to make a responsibility determination, a performance risk assessment, or an analysis of whether the offeror understands the work. (p. 589)

The ultimate goal of these proposal analysis techniques is to ensure the government receives a fair and reasonable price. The source selection process demands extreme

caution and due diligence as the success or failure of the acquisition, once awarded, is largely dependent upon the contractor selected (Garrett, 2007).

b. Negotiation

FAR Part 15 states that “any contract awarded using other than sealed bidding procedures is a negotiated contract.” Contracting by negotiation offers some flexibility to the award phase, allowing contractors to revise their proposals prior to award and assist in the formulation of the terms and conditions to be placed in the contract (Nash et al., 2007). Garrett (2007) explains that

the ideal is to develop a set of shared expectations and understandings. The buyer and seller must develop and agree to contract terms and conditions that are designed to express their mutual expectations about performance and that reflect the uncertainties and risks of performance. (p. 26)

A failure to communicate during this step can bring extreme tension to the business relationship during execution of the contract and result in cost and schedule growth (Garrett, 2007).

3. Post-Award Phase

After the contract is awarded, the contract management process focuses on monitoring and evaluating the contractor’s performance to ensure it is within the agreed upon technical, cost, and schedule constraints, and on executing a successful closeout or termination of the contract. Wright (2007) explains that “the degree of monitoring and surveillance of risk areas will vary depending upon the credentials, past performance, and experience of the selected proponent” (p. 11). For both the government and the contractor, the post-award phase represents the “fulfillment of the contractual obligations by all parties to the contract” (Garrett, 2007, p. 162).

a. Contract Administration

The primary purpose of contract administration is ensuring that both the government and the contractor are in “compliance with the terms and conditions of the contract” (Garrett, 2007, p. 182). Nash et al. (2007) list some of the tasks involved in this

process: “monitoring contractor progress, reviewing invoices, processing payments, and inspecting deliverables” (p. 129). Another key aspect of the contract administration process is managing the unexpected (Nash et al., 2007). The complex nature of certain contracts can result in a misunderstanding of the requirements, contractual disputes, or in some cases, the government’s needs evolving. When this happens, change requests or modifications to the contract are both common and necessary. Changes to the contract can and often do cause increases in price and schedule. Garrett (2007) recommends that when making changes to the contract, both parties be involved in estimating the impacts of the changes on cost and schedule. It saves time and helps ensure both parties understand what is being changed and the impact of that change. In some cases, the contractor is permitted to proceed with the changes prior to negotiation, but must adhere to a cost and schedule ceiling set by the government. With change comes risk that must be managed. Garrett (2007) states,

Managing change means ensuring that changes are authorized, their effect is estimated and provided for, they are promptly identified, the other party is properly notified, compliance and impact are reported, compensation is provided, and the entire transaction is properly documented. (p. 178)

b. Contract Termination or Closeout

Contract closeout involves closing out the contract, whether it is due to the successful completion of the contract or the termination for other reasons. Garrett (2007) asserts that “a contract can end in one of three ways: successful performance, mutual agreement, or breach of contract” (p. 185). When both parties meet the requirements set forth in the contract, a contract is closed out. Closing out a contract requires the government to certify that the contractor has completed the requirements set forth in the contract and the contractor to certify that it has been compensated as agreed upon in the contract.

There are two types of terminations as defined by FAR Part 49, termination for the convenience of the government or default of the contractor. Garrett (2007) provides a third option for termination: mutual agreement. Termination by mutual agreement occurs when both parties agree that they no longer want to be bound by the terms set forth in the

contract (Garrett, 2007). FAR 2.101 defines termination for cause or default as “the exercise of the Government’s right to completely or partially terminate a contract because of the contractor’s actual or anticipated failure to perform its contractual obligations.” FAR 2.101 defines termination for convenience as “the exercise of the Government’s right to completely or partially terminate performance of work under a contract when it is in the Government’s interest.” Garrett (2007) highlights that this unilateral right of the government to terminate for convenience has been the “subject of many U.S. court and legal decisions” (p. 191).

This section on the post-award phase focused on how the government monitors and evaluates contractor performance throughout the execution of the contract and discussed how the contract is closed out or terminated. The close-out or termination of the contract completes the contract management process. The next section includes a detailed discussion of the source selection strategy, which is developed during the procurement planning stage.

C. SOURCE SELECTION STRATEGY

The DOD source selection procedure provides the framework for developing the source selection strategy and is required for all competitive contracts by negotiation (Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics [OUSD(AT&L)], 2011). The best strategy can be derived from the evaluation of where the acquisition falls within the best value continuum. FAR 15.101 states,

An agency can obtain best value in negotiated acquisitions by using any one or a combination of source selection approaches. In different types of acquisitions, the relative importance of cost or price may vary. For example, in acquisitions where the requirement is clearly definable and the risk of unsuccessful contract performance is minimal, cost or price may play a dominant role in source selection. The less definitive the requirement, the more development work required, or the greater the performance risk, the more technical or past performance considerations may play a dominant role in source selection.

The government has two strategies it can choose between when developing the source selection strategy for a competitive, negotiated contract. As FAR 15.101 describes, some

acquisitions have requirements that are “clearly definable,” and the risk of the contractor failing to perform is minimal. In this case, the lowest price technically acceptable (LPTA) source selection strategy may be appropriate. On the other hand, if the requirement is “less definitive, more development work is required, or there is greater performance risk” (FAR 15.101), the tradeoff strategy may be more appropriate. FAR 15.101 further explains that the “tradeoff process is appropriate when it may be in the best interest of the Government to consider award to other than the lowest priced offeror or other than the highest technically rated offeror (HTRO).” The best value continuum can be thought of as the range between cost or price evaluation factors and the relative importance of non-cost or price factors. Figure 3 provides a visualization of the best value continuum.

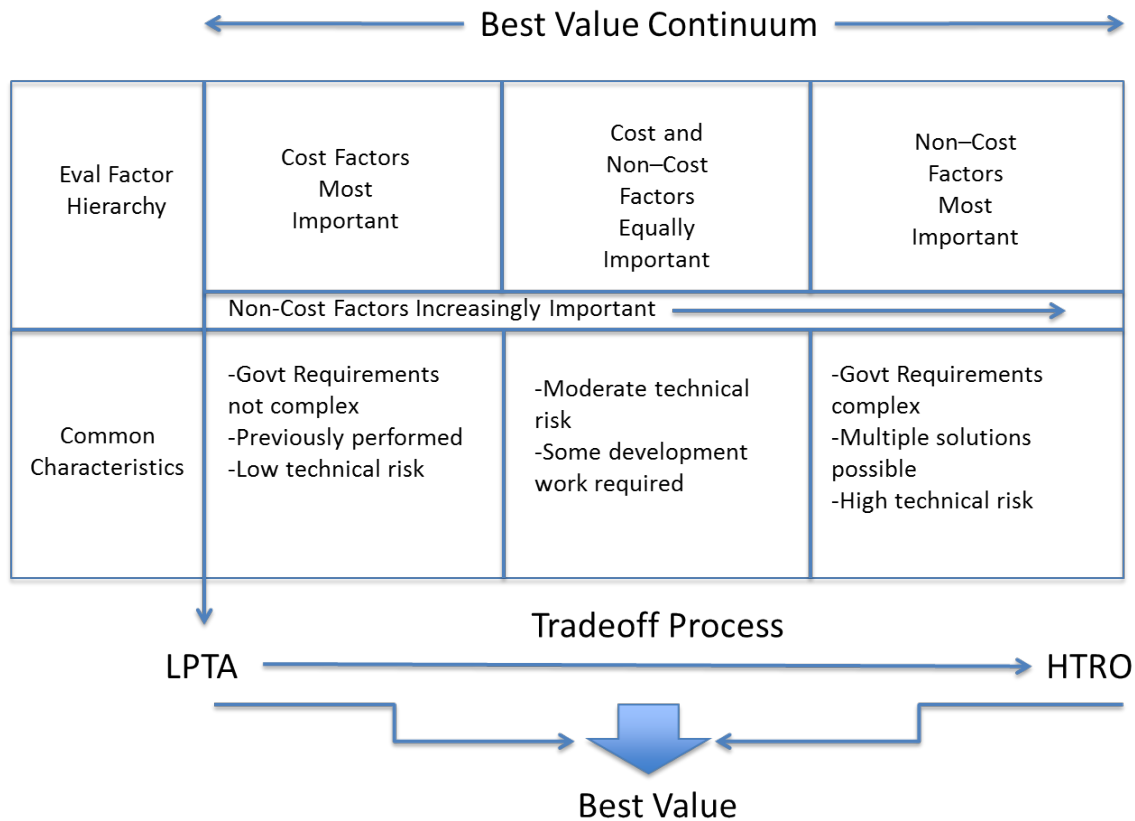


Figure 3. Best Value Continuum. Adapted from Naval Air Warfare Center (NAWC; 2015).

The ultimate goal of the government is to obtain the best value. FAR 2.101 defines best value as “the expected outcome of an acquisition that, in the Government’s

estimation, provides the greatest overall benefit in response to the requirement.” In developing the source selection strategy, the first step is determining the relative importance of cost and price to other evaluation factors, and identifying what those evaluation factors, other than cost and price, should be. This will determine whether LPTA or tradeoff should be used to achieve the desired best value to the government (Rumbaugh, 2010).

1. Lowest Price Technically Acceptable

FAR 15.101 states that “the lowest price technically acceptable source selection process is appropriate when best value is expected to result from selection of the technically acceptable proposal with the lowest evaluated price.” Price and cost are not the only evaluation factors considered in an LPTA decision, however. The technical acceptability of a proposal may contain other non-cost factors such as past performance or management capability, which are evaluated on a pass/fail basis. These non-cost factors must meet the government’s level of acceptability for the offer to then be ranked according to price. Once an acceptable range of offers is established based upon technical acceptance, the government must select the lowest priced offer (Rumbaugh, 2010).

2. Tradeoff

FAR 15.101 states, “A tradeoff process is appropriate when it may be in the best interest of the Government to consider award to other than the lowest priced offeror or other than the highest technically rated offeror.” The risk associated with certain acquisitions may merit the use of the tradeoff process. If the government requirements are difficult to define or there are multiple possible solutions to the government requirement, tradeoff may be the best source selection strategy (Rumbaugh, 2010). Non-cost factors can be given more weight, less weight, or equal weight to cost and price at the government’s discretion. These non-cost factors can include technical criteria, management criteria, past performance, and other qualitative or quantitative criteria (Garrett, 2007). These weights must all be stated within the solicitation notifying potential offerors how offers will be evaluated. FAR 15.101 explains that, in making the selection, “the perceived benefits of the higher priced proposal shall merit the additional

cost, and the rationale for tradeoffs must be documented.” Just as with LPTA, the ultimate goal of the tradeoff strategy is to obtain the best value for the government.

Given the immense importance of the source selection strategy, which is developed during the procurement planning step, it is reasonable to conclude that the most significant step in the contract management process is procurement planning. Defining the requirement and conducting market research sets the course for the rest of the contract management process. Given the significance of the source selection strategy to the contract management process, the following sections provide insight from investigative reports, industry perspective, and ongoing debates regarding current DOD practices and priorities when developing the source selection strategy.

D. INVESTIGATIVE REPORTS

Due to recent budget constraints, the DOD faces increased scrutiny from policymakers over its contract management. Since 1992, the GAO, the investigative arm of Congress, maintains DOD contract management in its high-risk category because the DOD continues to encounter challenges in providing relevant skills and capabilities to its contracting professionals, implementing sound techniques and approaches to awarding contracts, and properly managing its acquisition of services and contingency contracting (GAO, 2015). The GAO, as well as congressional policymakers, recently lauded the DOD’s efforts to tackle its contract management issues (H.R. Rep. 113–102, 2013). The DOD’s incremental improvements are reflected in the GAO’s 2015 High-Risk Series report to Congress. The improvements are due in part to the BBP initiatives created specifically to address contract management issues by promoting better efficiencies, controlling costs, cutting burdensome bureaucratic processes, and training its acquisition workforce (GAO, 2014).

Still, Congress is concerned that the DOD’s efforts to achieve the goals of the BBP motivates contracting professionals to employ LPTA as the default source selection strategy and inappropriately award LPTAs when a tradeoff approach is more suited. Therefore, as part of the National Defense Authorization Act of 2014, the House of Representatives and Senate committees required the DOD to report on its use of the best

value processes in hopes of ensuring that DOD contracting officials correctly determine the complexity of requirements, properly assign performance risk, and carefully assess whether failure to perform has significant implications (H.R. Rep. 113–102, 2013; GAO, 2014). Additionally, a House of Representatives report encouraged the DOD to obtain the views of the defense industry to determine how source selection strategies affect the industry’s business decisions, since part of the design of the best value continuum is to foster competition and innovation within the defense industry (H.R. Rep. 113–102, 2013).

In 2014, the GAO conducted a congressionally mandated review to determine the scope of the DOD’s use of best value strategies. From its review of 2,851 contracts awarded in fiscal year (FY) 2013, the GAO (2014) determined that 93% of the DOD’s competitively awarded contracts utilized best value processes. Sealed bidding accounted for the remaining 6% of contracts awarded. For contracts over \$25 million, the DOD used tradeoff 58% of the time compared to LPTA 36% of the time (GAO, 2014). For contracts over \$1 million but less than \$25 million, DOD use of LPTA and tradeoff was nearly equal. The DOD’s use of LPTA rose by 10% from a previous GAO review of contracts awarded in FY2009 (GAO, 2010). The DOD employed tradeoff strategies to acquire construction, maintenance, and other support services regardless of obligation, but for contracts greater than \$25 million, LPTA strategies were mostly used to acquire products. However, for contracts more than \$1 million but less than \$25 million, contracting professionals employed LPTA to acquire a combination of products and services (GAO, 2014).

DOD contracting professionals’ desire to meet BBP initiatives may drive them to employ LPTA more often. The GAO interviewed several officials from different commands across all services. These senior officials indicated that declining budgets and efforts to simplify requirements motivate commands to utilize LPTA more often than tradeoff (GAO, 2014).

Contracting professionals at NAVSEA interviewed by the GAO say senior command officials are placing more scrutiny on tradeoff procedures and instituting a “cultural shift” that normalizes LPTA as the preferred source selection strategy. As

evidenced by a NAVSEA memo to its contracting operations, a senior level acquisition executive must review the details of a potential acquisition if program managers determine that a non-cost factor is more important than price. Further, officials throughout all DOD services and agencies report that commands are shifting focus to utilize LPTA more often (GAO, 2014).

The previous discussion addressed investigative reports that indicate the DOD's increased frequency of employing LPTA. The next section discusses defense industry concerns that the increased use of LPTA reduces product and service innovation, constraining companies to cut costs to provide only the most marginally acceptable product or service to win a contract.

E. INDUSTRY PERSPECTIVE

Recently, the president of a satellite service provider suggested that the more frequent use of LPTA curbs defense industry innovation and capabilities, a sentiment shared by many in the defense industry. He continued, "In my opinion, I think the warfighter is getting a raw deal" (Magnuson, 2014, p. 1). The trend to use LPTA more often is drawing sharp criticism from operators in the defense industry (Magnuson, 2014). Defense industry experts contend that overusing LPTA will pressure industry to reduce innovation and compel it to leave the defense marketplace altogether. Furthermore, industry experts argue that the FAR should be updated to narrow the range of types of solicitations LPTA could be used for (Goodman, 2015).

Will Goodman (2015), assistant vice president for policy at the National Defense Industrial Association, argues that in a marketplace in which tradeoff is the primary source selection strategy, companies will respond by attempting to produce the best product at the most competitive price. However, in an LPTA-dominant industry, companies are incentivized to reduce their costs as low as possible to a point where they provides a service or product that marginally meets the technically acceptable requirement. Industry will reduce product innovation and, in an ironic twist, innovate in ways that reduce costs and product quality to meet the lowest price target. By employing only an LPTA solution, Goodman argues the DOD is telling contractors to "make [a]

product as cheaply as you can ... as long as it meets minimum requirements. If you refuse, we will punish you by awarding the contract to someone else” (Goodman, 2015, p. 18). As discussed in the literature review, Goodman’s argument can be countered by applying price realism and cost competitiveness. Price realism is used to determine if a proposed price is too low to realistically achieve the requirements of the contract, and cost competitiveness is used to determine if the price is too high compared to the level of effort to achieve the requirement (Garrett, 2007).

Goodman (2015) concludes by arguing that the FAR is incomplete and does not adequately address the economic and future capability consequences from employing LPTA strategies. Goodman contends that the FAR should explicitly state that LPTA is best used for commodities and commoditized services, and acquisition professionals should consider the long-term implications of a capability area required by the solicitation (Goodman, 2015).

We next discuss the ongoing debate regarding source selection strategies and how decision makers should first assess several multifunctional indicators to determine a contract’s complexity and risk and use that determination to attain the best value in a source selection.

F. ONGOING DEBATE

Previously, we discussed GAO reports revealing the DOD’s current inclination to award LPTA contracts more frequently compared to previous years and defense industry perspectives that the increased use of LPTA is stifling competition and innovation, and driving down industry’s profit. In response to industry’s concerns, two Defense Acquisition University (DAU) faculty members, Brian Schultz and David Dotson (2015), propose a more holistic approach to assist contracting officers in selecting the best source selection strategy.

Schultz and Dotson (2015) argue that Goodman’s (2015) proposed changes to the FAR are not feasible since program-level contracting officers should not be expected to—nor have the capability to—determine the economic consequences of solicitations over an extended period of time. Schultz and Dotson propose a different methodology

that enlists program decision makers, with support of the contracting officer, to assess multifunctional areas beyond just performance requirements to help program managers settle on the best value in a source selection. The multifunctional areas program decision makers should evaluate are the contractor's organizational landscape, the requirement's mission and operational interfaces, industrial capabilities to deliver a requirement, contract deliverables, and risk and opportunity management (Schultz & Dotson, 2015).

First, Schultz and Dotson (2015) maintain that organizations that are adequately staffed, experience low management turnover, and align resources to their strategy and goals will be more suited to administer and manage complex tradeoff contracts. Contracting professionals should determine if organizations possess these qualities, since well-managed organizations plan, resource, and execute highly complex acquisition programs more adroitly than poorly managed organizations (Schultz & Dotson, 2015).

Next, program decision makers should determine whether a requirement needs to be integrated into the overall operational environment. In other words, a requirement may need to exist, operate, and interface with multiple systems within an environment. Program decision makers should consider the risks and complexities of an acquisition if a rapidly evolving technical requirement must operate in an operational environment (Schultz & Dotson, 2015).

Third, program decision makers should determine industry's ability to produce a requirement. They should study a contractor's past performance records to include a review of that contractor's supplier performance. Poor first and second tier suppliers can lead to schedule delays and quality issues. This information can provide relevant insight into the potential risks and complexities of an acquisition. Also, program decision makers should conduct in-depth market research to gather pertinent information regarding the character of the acquisition and the industry that will produce the acquisition. For example, program decision makers may determine that a requirement's design is highly complex, yet ultimately conclude that the acquisition is low risk because companies that operate within the industry are adept at making the system (Schultz & Dotson, 2015).

Fourth, program decision makers should clarify exactly what they need, how much of it they want, and how much they are willing to pay for it. They should spell out exactly what a successful contractual performance would entail. Additionally, program decision makers should determine the monetized value of performance above the minimum threshold requirement, a key process that Frank Kendall writes about to determine an appropriate source selection strategy (Schultz & Dotson, 2015).

Finally, after reviewing the first four functional areas described by Schultz and Dotson (2015)—organizational structure, operational interfaces, industry capabilities, and contract deliverables—program decision makers should pinpoint and calculate risk areas and ways to mitigate these risks. Putting it all together, program decision makers should generate an assessment that deems the acquisition as low, moderate, or high complexity and risk, based on the multifunctional assessment. Schultz and Dotson (2015) then apply the assessment to a color schematic “integrated assessment rating scale” where green is portrayed as low complexity and risk, yellow as moderate complexity and risk, and red as high complexity and risk (p. 7). Program decision makers should view an acquisition assessed in the red category as a candidate for a tradeoff source selection strategy, whereas acquisitions that fall towards the green side of the scale may be awarded via the LPTA strategy (Schultz & Dotson, 2015).

G. SUMMARY

The preceding literature review covered the statutes and regulations applicable to the contract management process, the steps of the contract management process, and source selection strategies. The literature review also identified GAO reports that show the DOD’s inclination to employ LPTA more often in recent years, the defense industry’s response to the increased prevalence of LPTA, as well as the ongoing debate regarding source selection strategies. The next chapter discusses an overview of DOD acquisition organizations, Navy acquisition organizations, and NAVSEA.

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III. DOD ACQUISITION ORGANIZATION

This chapter provides an overview of the DOD acquisition organizations, Navy acquisition organizations, and Naval Sea Systems Command (NAVSEA). The research provides information on each organization’s responsibilities, structure, mission, and function. It also highlights the layers of bureaucracy and oversight within the defense acquisition system.

A. DOD ACQUISITION STRUCTURE

The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]) is “the principal assistant and advisor to the Secretary of Defense and Deputy Secretary of Defense for all matters concerning acquisition, technology, and logistics” (OUSD[AT&L], 2016, para. 1). As outlined in 10 U.S.C. § 133 (2011), “the primary responsibilities of the USD(AT&L) include: supervising acquisition in the Department of Defense; establishing policies for acquisition; logistics; and, maintaining and sustaining of all elements within the Department of Defense.” Additionally, the USD(AT&L) is responsible for developing policy for the maintenance of the defense industrial base and has the authority to direct the service secretaries with regard to matters under which the under secretary has responsibility (10 U.S.C. § 133, 2011). The USD(AT&L) has oversight responsibility for space and intelligence programs, missile defense programs, operational energy programs and plans, military installations and their environment, and major weapon systems (OUSD[AT&L], 2016a). The USD(AT&L) also serves as the defense acquisition executive (DAE) for the Milestone Decision Authority (MDA) on major weapon system acquisition. Figure 4 illustrates the hierarchical structure of the OUSD(AT&L).

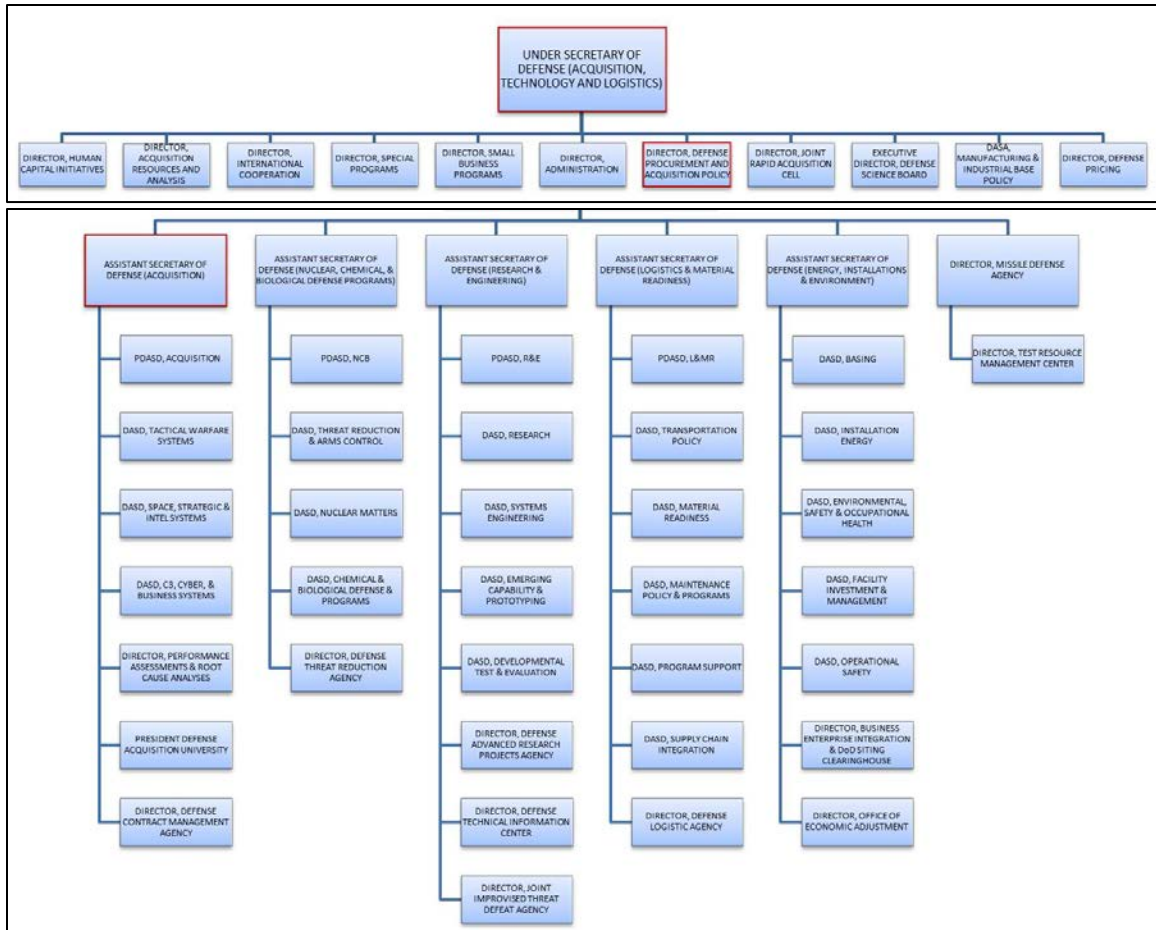


Figure 4. OUSD(AT&L) Organizational Structure. Adapted from OUSD(AT&L) (2016b).

Each military component has a service acquisition executive (SAE) who reports to the DAE. Within the military departments, the officials delegated as SAEs are as follows: the assistant secretary of the Navy for research, development, and acquisition (ASN[RD&A]); the assistant secretary of the Army for acquisition, logistics, and technology (ASA[AL&T]); and the assistant secretary of the Air Force for acquisition (ASAF[A]). In turn, each SAE is responsible for developing and implementing procedures within the respective components in accordance with the DOD 5000 Series Directives (DOD, 2012).

Within the Office of the Secretary of Defense for Acquisition, Technology, and Logistics (OSD[AT&L]), the Director of Defense Procurement and Acquisition Policy (DPAP) develops and implements policy through the Defense Federal Acquisition

Regulation Supplement (DFARS); procedures, guidance, and information (PGI) updates; and DOD Directive 5000.01 and DOD Directive 5000.02. The OSD(AT&L)'s mission is to "provide innovative acquisition and procurement policy that will effectively deliver services and equipment to the warfighter while being good stewards of the taxpayers' dollar" (DPAP, n.d.-c, para. 1).

There are seven directorates within DPAP that support this mission, as outlined in Figure 5. The operations directorate provides oversight to the other six directorates and manages budget planning, travel, human resources, legislative concerns, strategic planning, and workforce management for the contracting community. The Defense Acquisition Regulations System (DARS) directorate develops and maintains the DFARS, publishes PGI updates, leads the Defense Acquisition Regulations (DAR) Council, and issues and maintains class deviations. The Contract Policy and International Contracting (CPIC) directorate is responsible for "developing new, innovative acquisition policies and improving existing DOD acquisition policies" (DPAP, n.d.-c, para. 1). The contingency contracting directorate is responsible for policy and resources when contracting is performed in a contingency environment, and the program acquisition directorate is responsible for the development and supervision of procurement strategies of major defense acquisition programs. Lastly, a relatively new directorate is services acquisition and strategic sourcing. Established in 2013, this directorate is responsible for all aspects of service acquisition oversight to include "developing, implementing, governing, and executing the acquisition oversight framework of services, and for the championing of strategic sourcing policy and initiatives, for the DOD" (DPAP, n.d.-a para. 1).

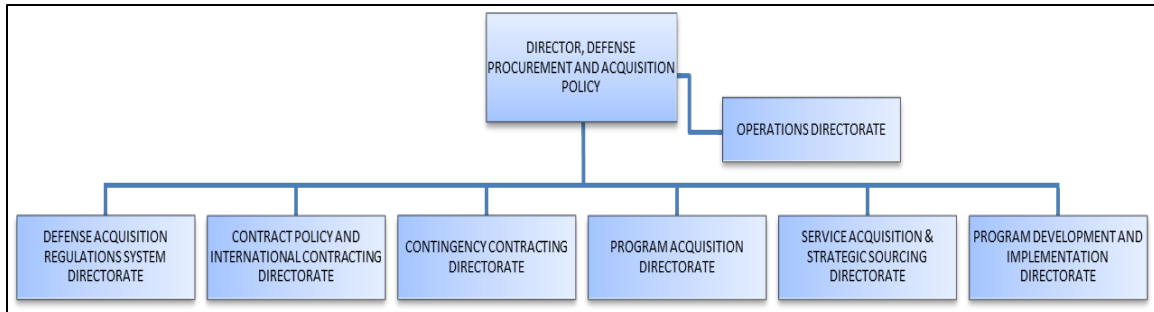


Figure 5. DPAP Organizational Structure. Adapted from DPAP (n.d.-d).

B. NAVY ACQUISITION ORGANIZATION

The assistant secretary of the Navy for research, development and acquisition (ASN[RD&A]) serves as the Navy acquisition executive. The mission of the office is to develop, acquire, and deliver state-of-the-art platforms, systems, and weapons that will give Sailors and Marine Corps personnel an asymmetrical advantage over the nation’s adversaries (ASN[RD&A], n.d.-b). The ASN(RD&A) is accountable and responsible for all acquisitions functions, programs, and policy under the Department of the Navy umbrella. The Office of the ASN(RD&A) consists of an immediate staff, direct reporting program managers (DRPMs), program executive officers (PEOs), and program managers (PMs).

As a result of the 1986 Packard Commission report, NAVSEA, Naval Air Systems Command (NAVAIR) and Space and Naval Warfare Systems Command (SPAWAR), were the first Navy systems commands (SYSCOMs) to implement a PEO structure within each of their organizations. The PEO structure creates clear lines of accountability and responsibility, as the PEO is the main stakeholder responsible for cost, schedule, and performance in major acquisition programs or portfolios of programs (DOD, 2007). DRPMs are also the main stakeholder and are assigned to challenging acquisition programs for temporary periods of time to resolve critical acquisition issues. There are 15 standalone Navy PEOs and DRPMs:

- PEO Joint Strike Fighter
- PEO Ships
- PEO Submarines

- PEO Aircraft Carriers
- PEO Tactical Air Program
- PEO Air Anti-Submarine Warfare
- PEO Assault and Special Mission Programs
- PEO Strike Weapons and Unmanned Aviation
- PEO Space Systems
- PEO Littoral and Mine Warfare
- PEO Integrated Warfare Systems
- PEO Enterprise Information Systems
- PEO Command, Control, Communications, Computers, and Intelligence (C4I)
- PEO Marine Land Systems
- DRPM Strategic Systems Programs (ASN[RD&A], n.d. a)

Figure 6 illustrates the Navy's acquisition reporting structure for PMs, PEOs, DRPMs, and SYSCOMs. PMs report through their appropriate PEO or SYSCOM and through them to the ASN(RDA). SYSCOMs also report to the Chief of Naval Operation (CNO) for administrative and inter-service support. DRPMs report directly to the ASN(RDA; DOD, 2007).

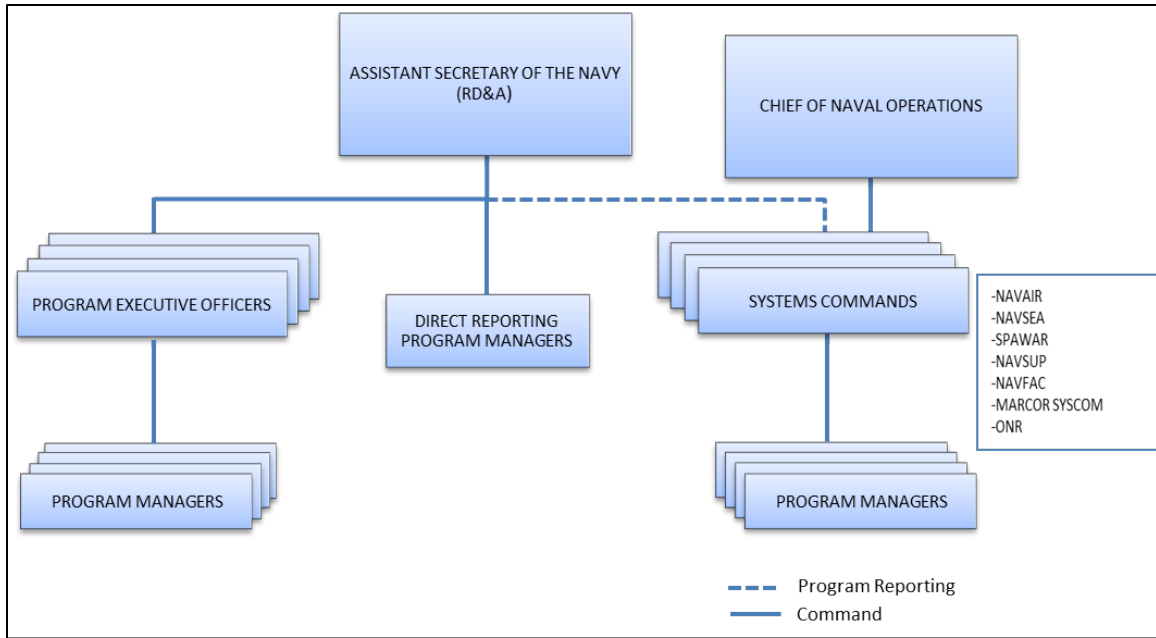


Figure 6. Reporting Chain for Navy Acquisition.
Adapted from DOD (2007).

C. NAVAL SEA SYSTEMS COMMAND

NAVSEA’s mission is to “build, design, deliver and maintain ships and systems on time and on cost for the United States Navy” (NAVSEA, 2013, p. 1). Its vision statement is to be “the nation’s team, accountable for the health of the United States Navy’s fleet of ships and to set the value-added standard for acquisition, engineering, business, and maintenance” (NAVSEA, 2013, p. 2). NAVSEA is the largest SYSCOM in the Navy in terms of both workforce and budget. Its yearly budget of approximately \$30 billion represents one-fourth of the Navy’s overall budget (NAVSEA, 2013). Figure 7 depicts how NAVSEA and the other four SYSCOMs align with other naval shore establishments.

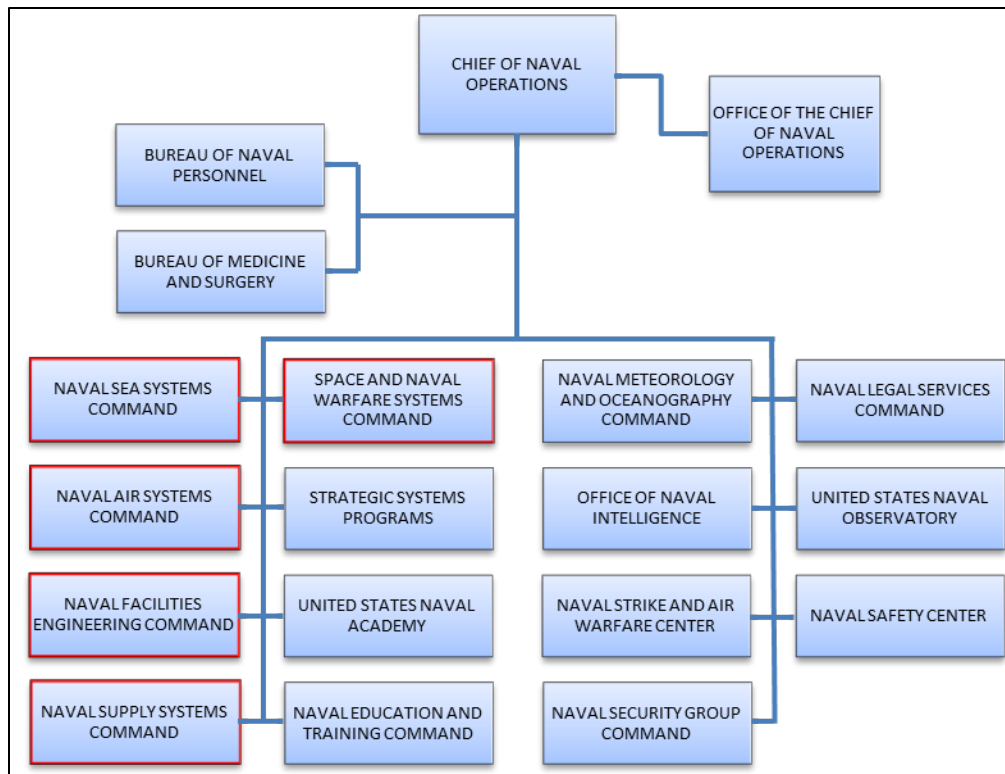


Figure 7. Navy SYSCOMs in Relation to Other Navy Shore Establishments.
Adapted from United States Navy (n.d.).

Figure 8 depicts NAVSEA’s command staff: its headquarter directorates and its five affiliated PEOs and field activities. Together, “they design, build, procure, and maintain ships, submarines, and combat systems that meet current and future operational requirements” (NAVSEA, n.d.-a para. 1).

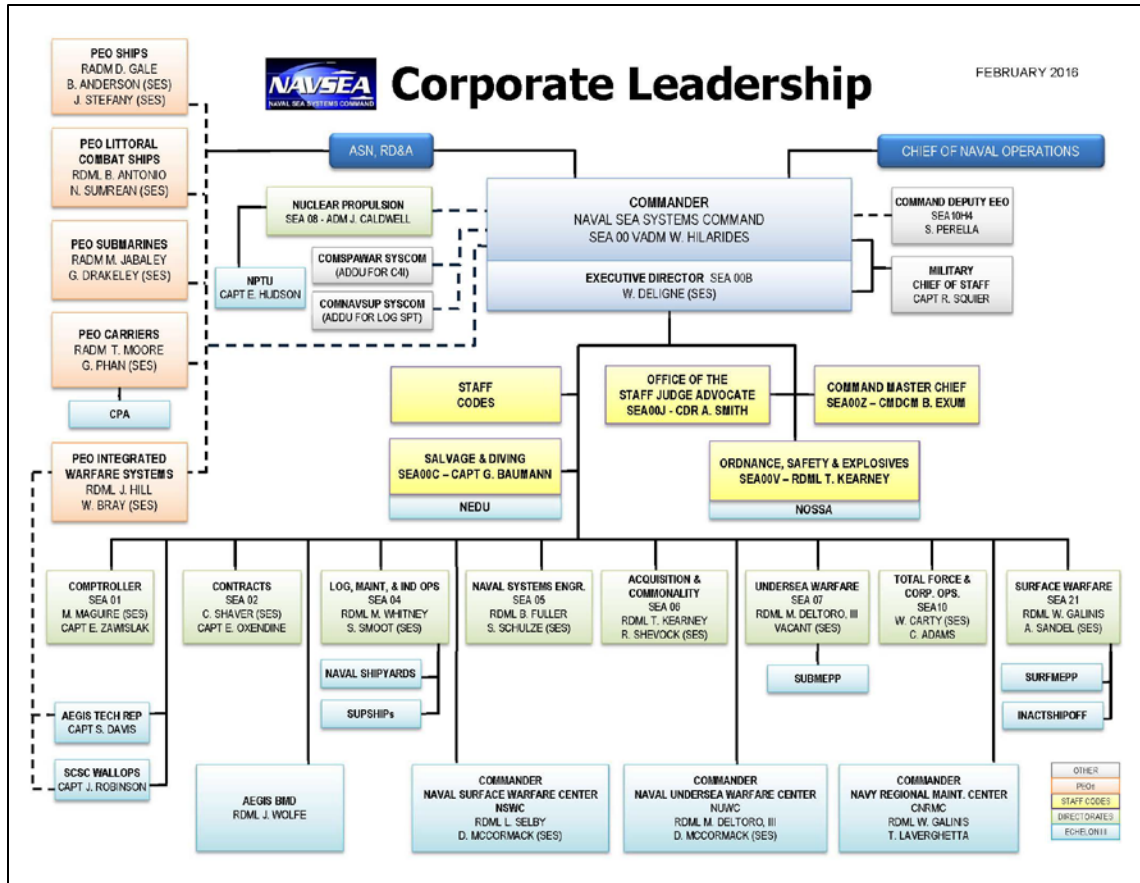


Figure 8. NAVSEA Corporate Leadership 2016. Source: NAVSEA (2016).

NAVSEA has five PEOs who are responsible for the development, acquisition, and life-cycle management of their assigned programs. For planning and execution of life-cycle management and sustainment, PEOs report to the NAVSEA commander. For acquisition-related matters, PEOs report to the ASN(RD&A). The five affiliated NAVSEA PEOs and a brief description of each follows:

- PEO Aircraft Carriers manages all aircraft carrier life-cycle support, design, construction, and delivery.
- PEO Integrated Warfare Systems manages all combat systems for surface ships and submarines.
- PEO Littoral Combat Ships manages design, procurement, fleet employment, and sustainment for littoral combat ships.
- PEO Ships manages and is responsible for research, development, acquisition, and life-cycle support for all non-nuclear surface ships.

- PEO Submarines manages the design, construction, and delivery of all submarines, advanced undersea systems, and anti-submarine systems (NAVSEA, n.d.-c).

Each year, NAVSEA's contracts directorate (SEA 02) and its field contracting offices process approximately 60,000 contracting actions for modification, new construction of ships and submarines, weapon systems, maintenance, repair, and services. SEA 02 is headquartered at the Naval Shipyard in Washington, DC. It is broken down into five divisions, which specialize in policy, shipbuilding, fleet support, surface systems, and undersea systems, respectively. The Shipbuilding Contracts Division supports four field procurement offices: the Supervisor of Shipbuilding in Newport News, VA; Bath, ME; Groton, CT; and Gulf Coast Pascagoula, MS. The Fleet Support Contracts Division is also headquartered at the Naval Shipyard and supports two naval shipyards located in Pearl Harbor, HI, and Kittery, ME. It also supports four regional maintenance centers located in San Diego, CA; Bremerton, WA; Norfolk, VA; and Mayport, FL. The Surface Systems Contracts Division supports seven warfare centers located in Panama City, FL; Indian Head, MD; Crane, IN; Port Hueneme, CA; Corona, CA; Philadelphia, PA; and Dahlgren, VA. SEA 02's Undersea Contracts Division supports two undersea warfare centers located in Keyport, WA, and Newport, RI (NAVSEA, n.d.-b). Together, they provide a wide variety of acquisition and contract support to efficiently maintain a fleet of nearly 380 ships and submarines, their weapon systems, and supporting infrastructure.

D. WHY WAS NAVSEA CHOSEN FOR OUR RESEARCH

NAVSEA was selected for this research project because it procures complex sea systems that are unique to the Navy, but does so through the same contract management processes used throughout the DOD and the federal government. Additionally, NAVSEA was selected for this research because it is the largest procurement organization in the Navy that conducts thousands of contracting source selections each year that will assist in answering our research questions.

E. SUMMARY

Chapter III provided an overview of the DOD's acquisition mission, responsibilities, and organization. It also focused on the Navy's organization of acquisition activities and its largest SYSCOM, NAVSEA. Chapter IV provides a description of the data collected, data analysis, and findings.

IV. ANALYSIS

In this chapter, we provide an overview of prior research teams that conducted similar research, and we discuss the research methodology we used to answer our research questions. Specifically, we address the variables examined and their associated descriptive statistics, the analysis method we used, and the problems associated with our data. Finally, we present the answers to our research questions.

A. OVERVIEW OF PRIOR RESEARCH

Our research is part of an ongoing research initiative that is attempting to determine if a relationship exists between source selection strategies and performance outcomes. Using the same methodology and data collection guide, but utilizing different streams of data, our research attempts to answer the same or very similar research questions proposed by the following Naval Postgraduate School research teams:

- Watson (2015)
- Lamoureux, Murrow, & Walls (2015)
- Ban, Barnes, & Comer (2015)
- Bastola, Findley, & Woodward (2015)
- Hill, Odom, Osman, & Paul (2016)

Our data collection guide (Appendix) was an Excel spreadsheet developed by our advisors to guide our research efforts using a systematic and standardized approach.

B. VARIABLES EXAMINED

For this analysis, PALT and CPARS ratings were used as the two main dependent, or outcome, variables (DVs). PALT is a continuous variable that is calculated as the date between receipt of requisition and the date of contract award. Contracting professionals assign CPARS ratings to a completed contract to measure the performance of the contract. Each contract's CPARS rating was based on the following variables: Cost, Quality, Schedule, Business Relationship, and Subcontracting. Each variable receives a rating using Likert-style responses: 1 = Unsatisfactory, 2 = Marginal, 3 =

Satisfactory, 4 = Very Good, and 5 = Excellent. In this research, we used an overall average of CPARS ratings as the second DV (i.e., we combined each variable's CPARS rating to make an average CPARS rating for each contract).

Our model contained one independent variable (IV). A researcher may use an IV to induce a change in an outcome, or DV. In our case, the IV equates to the source selection strategy used for the contract: LPTA or tradeoff. An integrated product team, specifically the Contracting Officer, will choose the preferred source selection strategy. The IV is assigned LPTA or tradeoff (LPTATO) and is a binary variable where 0 = LPTA and 1 = tradeoff.

Lastly, our analysis contained four covariate variables. Covariates are secondary variables that can affect the relationship of primary interest. Essentially, covariate variables affect the relationship between the IV and the DV and are variables other than the IV that possibly affect the outcome variable, or DV. Our initial list of covariates included (a) contract dollar value (VALUE), (b) number of evaluation factors (NUMEVALFACTORS), (c) number of reviews (NUMREVIEWS), and (d) number of offers (NUMOFFERS). All four covariates are continuous variables. We intend to remove the effects of the covariates in hopes of seeing the effects a source selection strategy (LPTATO) has on the outcome variables (PALT or CPARS ratings).

C. DESCRIPTIVE STATISTICS

Figure 9 shows the basic descriptive statistics for each variable and indicates descriptive statistics for (a) all the data, (b) LPTA source selections, and (c) tradeoff source selections.

Descriptive Statistics					
Bold=total for all data, non-italicized=LPTA, italicized=tradeoff					
Variable	Obs	Mean	SD	Min	Max
PALT (days)	24	447.61	300.86	123	1269
	4	277.50	114.17	167	398
	<i>13</i>	<i>524.15</i>	<i>318.70</i>	<i>171</i>	<i>1269</i>
Average CPARS Rating	12	3.54	.73	2.60	5.00
	1	3.00	0.00	3.00	3.00
	6	3.37	.78	2.60	4.80
Average Dollar Value	24	\$73,500,000	\$106,000,000	\$747,736	\$386,000,000
	5	\$15,700,000	\$32,000,000	\$747,736	\$72,900,000
	<i>13</i>	<i>\$82,100,000</i>	<i>\$122,000,000</i>	<i>\$982,898</i>	<i>\$386,000,000</i>
Number of Evaluation Factors	17	3.35	1.66	1.00	6.00
	4	1.00	0.00	1.00	1.00
	<i>13</i>	<i>4.08</i>	<i>1.12</i>	<i>2.00</i>	<i>6.00</i>
Number of Reviews	16	3.19	2.88	1.00	13.00
	2	1.00	0.00	1.00	1.00
	<i>12</i>	<i>3.50</i>	<i>3.21</i>	<i>1.00</i>	<i>13.00</i>
Number of Offers	24	1.71	.99	1.00	4.00
	5	1.00	0.00	1.00	1.00
	<i>13</i>	<i>2.31</i>	<i>1.03</i>	<i>1.00</i>	<i>4.00</i>

Figure 9. Descriptive Statistics for All Data, LPTA, and Tradeoff

D. DATA ISSUES

Upon review of the descriptive statistics, it is clear that we had too few LPTA cases. For the LPTA source selection strategy, our data consisted of four PALT and one CPARS rating. For the tradeoff source selection strategy, our data consisted of 13 PALT and six CPARS ratings. Power calculations ($\alpha = .05$, $\beta = .80$) suggest we would have needed 11 PALT cases and 28 CPARS cases for each source selection strategy to achieve an acceptable statistical power. We were clearly lacking in both PALT and CPARS cases. Furthermore, the data were substantially unbalanced regarding the number of cases for each source selection strategy (five LPTA cases and 19 tradeoff cases). An unbalanced design will lead to uncertainty about the mean as the intercept and will make designation of sums of squares more complicated. As an alternative solution, however, a weighted

mean may be employed as a substitute to the grand mean,¹ and the Stata software will inevitably control the assignment of the sums of squares.

E. METHODOLOGY

Our intention was to apply a technique called multivariate analysis of covariance, or MANCOVA, to evaluate differences in contract outcomes (PALT and CPARS ratings) based on contracting methodology (LPTA or tradeoff). MANCOVA, a group comparison method, is a technique that generates a new dependent variable using information from our dependent variables (PALT and CPARS ratings). This new dependent variable exploits differences between the grouping variable (LPTA or tradeoff source selections). However, the data failed to meet many of the assumptions required for MANCOVA because of the lack of cases. Similarly, we could not examine the DVs separately using the univariate method of analysis of covariance (ANCOVA) due to the lack of cases.

With our limited data, we performed a multiple regression using PALT as the DV to assess whether or not NUMREVIEWS (the new IV)² and NUMOFFERS (covariate) significantly affected the PALT for tradeoff source selections. Unfortunately, we had to drop VALUE and NUMEVALFACTORS because they did not pass the linearity assumption. However, we must caution the reader that there was not enough statistical power to interpret the results with confidence.

F. ASSUMPTION TESTING

Prior to conducting the multiple regression, we assessed certain assumptions concerning the data. First, we looked for any missing cases and located one case that was missing the NUMREVIEWS variable. We chose to delete the case using listwise deletion ($n = 12$). Second, we looked for outliers using plots of the DV against the IV and covariate—one outlier on the NUMREVIEWS variable was found and subsequently dropped ($n = 11$). Third, we examined the normality of each of the variables. PALT,

¹ The grand mean is the intercept in a balanced design.

² NUMREVIEWS is now considered the IV, as it can be manipulated by naval contracting policies. Previously, we made the assumption that the policies are not up for revision. NUMOFFERS remains a covariate variable that may affect PALT independently of the IV.

NUMREVIEWS, and NUMOFFERS all received a logarithmic transformation, which significantly improved their positive skewness. Fourth, we assessed linearity between the variables. Linearity was not a problem for NUMREVIEWS and NUMOFFERS, but it is important to keep in mind that we have a very small number of cases, so there are few data points to determine linearity. Finally, we checked for multicollinearity, which is not an issue.

With all assumptions tested, we perform a multiple regression between PALT as the DV, NUMREVIEWS as the IV, and NUMOFFERS as the covariate. We used only tradeoff cases, as an insufficient number of LPTA cases existed for this analysis.

G. RESULTS

Using PALT as the DV, the results showed that the model is not significant ($F(2,8) = 2.56, p = .14$). Neither NUMREVIEWS ($b_1 = .42, ns$) or NUMOFFERS ($b_2 = .65, ns$) significantly affected time-to-contract in tradeoff source selections. These results were not surprising, because even though the tradeoff strategy contained our largest pool of data, there was an insufficient number of cases to achieve statistical significance. More data are required to adequately test our hypotheses.

H. SUMMARY

The chapter identified previous research teams that have contributed to this overall research effort and provided an overview of the research methodology used to answer our research questions. We identified and provided a basic description of the variables used in our data analysis, addressed assumptions and discussed data issues, and, finally, delivered our results. Chapter V provides a summary, our conclusion, and recommendations for further research.

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V. SUMMARY, CONCLUSION, AND RECOMMENDATIONS FOR FURTHER RESEARCH

In this chapter we present a summary of our research, conclusions to our research questions, and recommendations to guide future research efforts.

A. SUMMARY

Current and future budget realities are compelling contracting professionals to become more efficient in their procurement efforts. Developing an acquisition strategy based on sound procurement planning is one of the most important aspects of the contract management process. The source selection strategy—be it LPTA, tradeoff, or a variation of the two along the best value continuum—should ensure that “the expected outcome of an acquisition ... provides the greatest overall benefit in response to the requirement” (FAR 2.101). Recent GAO reports signal DOD’s increased frequency of employing LPTA, and some in the defense industry are concerned that an increase in LPTA will undermine industry innovation and companies will focus on cutting costs. To alleviate industry concerns, Schultz and Dotson encourage contracting professionals to use a more holistic approach that considers an organization’s landscape, the requirement’s mission and operational interfaces, industrial capabilities, contract deliverables, risk, and opportunity management when determining an appropriate source selection strategy. The purpose of this research was to explore the possible relationships between the contract source selection strategy and pre-award and post-award performance metrics. Data were collected from contract files at NAVSEA. NAVSEA was chosen because it is the Navy’s largest procurement organization, buying complex sea systems unique to the Navy through the same contract management processes used throughout the DOD and federal government. Our data were analyzed to determine if relationships exist between source selection strategies and performance outcomes.

B. CONCLUSIONS

The objective of our research was to determine if source selection strategy affects pre- and post-award metrics. Specifically, as stated in Chapter I, our research intended to answer the following questions:

1. How does the source selection strategy affect pre-award metrics (e.g., PALT, number of solicitation amendments or protests)?

Despite the data collected to answer this question, they were insufficient for statistical analysis. The sample size was not numerically sufficient to complete the desired analysis. However, we observed a positive correlation between average dollar value and source selection strategy. Within our small sample, a higher dollar value seemed to be associated with the use of the tradeoff source selection strategy. Similarly, a positive correlation between PALT and source selection strategy seems to suggest that longer PALTs are associated with the tradeoff strategy. This is intuitive, as the tradeoff strategy is typically used in procurements with requirements that are difficult to define or allow for multiple solutions. In addition, given the multitude of non-cost factors evaluated using the tradeoff strategy, the development of offers and the source selection process itself are likely to demand more time than the more objective, price-focused LPTA strategy. The higher complexity of the procurements using the tradeoff strategy seems to explain the association with a longer PALT.

2. How does the source selection strategy affect post-award ratings (CPARS and EVM performance metrics)?

Despite the data collected to answer this question, they were insufficient for statistical analysis. Thus, we were not able to answer the questions we sought to answer at the beginning of this research. Our research has, however, increased the data pool and refined the methodology for future research teams. We provide recommendations for future research in the next section.

C. RECOMMENDATIONS FOR FURTHER RESEARCH

Our research project is part of an ongoing research initiative that requires additional data. Previous research teams have recommended that future researchers gather more EVM and CPARS data to further this research initiative. These generalized

recommendations led us to believe that we needed to locate high dollar value contracts that would trigger CPARS and EVM reporting requirements and provide us with historical documentation in the contract file. This assumption was incorrect. We identified contracts that were required to document contractor performance and utilize EVM reporting, but as we reviewed the contract files, we discovered that CPARS and EVM reports were not located in the archived contract file. However, after we completed our onsite research visit to NAVSEA, we discovered that PARCA established an EVM centralized repository (EVM-CR) in 2007 that maintains EVM data on Acquisition Category (ACAT) 1A, 1C, 1D, and other high visibility acquisition programs. Based on this new information, we make the following recommendations.

1. Recommendation #1

Prior to selecting a contracting organization to conduct onsite research, we recommend that future research teams obtain access to the PARCA EVM-CR and identify a unit identification code (UIC) that contains an adequate sample size of contracts that contain EVM data to support additional research. By doing so, future research teams will be able to gather one of the most challenging data points first and work through predetermined contract files to locate the remaining necessary data.

2. Recommendation #2

Once contracts are identified through the PARCA EVM-CR, we recommend contacting the procurement organization that manages the contracts and requesting access and approval to conduct onsite research. If approved, we recommend forwarding the contract numbers to the organization's CPARS program analyst. The CPARS program analyst will be able to generate CPARS data reports useful to the research project and may identify information missing from the report. During our research, we found that some CPARS reports were not properly documented and that program managers (PMs) and contracting officer representatives (CORs) contact information was missing. Being able to identify, prior to an onsite visit, which contracts are missing PM and/or COR contact information will enable future research teams to identify PM and COR contact information from the archived contract files. Once PM and COR contact information is

obtained, we recommend future research teams contact each PM and/or COR to obtain the necessary CPARS data points.

To assist our advisors in further research, we have provided 50 contract numbers from NAVSEA that contain EVM data and recommend that those numbers be turned over to future research teams. We also recommend that future research teams do not underestimate the size and number of volumes many of the contract files contain and the time-intensive nature of locating specific data points for the Excel data guide. We also recommend that research teams do not visit organizations that do not employ a sufficient mixture of LPTA and Tradeoff source selection strategies. For example, Fleet Logistic Center Norfolk typically procures simple, low dollar value commodities that do not provide ample data points and do not contribute to the overall research initiative. We hope our recommendations prove useful to future research teams and that they will be able to use our methodologies to obtain adequate statistical power to test the relationship between source selection strategies and performance outcomes.

APPENDIX. DATA COLLECTION CATEGORIES

Basic Info						
Observation #	Service	Organization	Contract Number	Name	NAICS	PSC
Acquisition Complexity						
Predominant Contract Type	Sole Source	SB Set Aside	Consolidated Requirement	Multiyear	# Years	Dollar Value
Trade Off or LPTA	# Evaluation Factors	Eval Factor #1	# Subfactors in EF#1	Eval Factor #2	#Subfactors in EF#2	Eval Factor #3
# Subfactors in EF#3	Eval Factor #4	# Subfactors in EF#4	Eval Factor #5	# Subfactors in EF#5	# Subelements	ACAT/SCAT Level
FAR Part	Life Cycle Stage	Joint Urgent Operational Need (JUON)	# CLINs	Pre-Solicitation Conference/ Industry Day	Pre-Proposal Conference	Pre-Award/Pre-Performance Conference
# Offerors	# Competitive Range	Single or Multiple Award	On-Ramp Provision	Incentive Fee Criterion #1	Incentive Fee Criterion #2	Incentive Fee Criterion #3
Incentive Fee Criterion #4	Incentive Fee Criterion #5	Award Fee Criterion #1	Award Fee Criterion #2	Award Fee Criterion #3	Award Fee Criterion #4	Award Fee Criterion #5
Environmental Factors						
# Reviews	Review 1 Date	Review 2 Date	Review 3 Date	Review 4 Date	# Personnel on Source Selection Team	Source Selection Authority
# Team Locations	ACE Support	MIRT Support	Use of Collaboration Tools	Abundance/ Lack of File Documentation Rating	State of the Economy	
Outcome Variables						
PALT - Requirement Receipt Date	PALT - RFP Issue Date	PALT - Proposals Received Date	PALT - Contract Award Date	PALT - Days	Early Strategy and Issues Session (ESIS) Date (>\$100M)	ASP Date
Protest	Protest Level	Protest Results	Corrective Action (Describe)	CPAR Cost Control	CPAR Technical (quality of product or service)	CPAR Schedule/ Timeliness
CPAR Mgt of Business Relationship	SB Subkting (if applicable)	EVM CV	EVM SV	EVM CPI	EVM SPI	Nunn-McCurdy Breach
# of RFP Amendments	RFP Amendment Reason 1	RFP Amendment Reason 2	RFP Amendment Reason 3	RFP Amendment Reason 4	RFP Amendment Reason 5	RFP Amendment Reason 6
Earned Award Fee %	Earned Fee Amount/ Target Fee					
Other Variables						
# Evaluation Notices	# ENs Pre-Competitive Range	# ENs Post-Competitive Range	# Rounds of ENs	# Clarification Requests	# Deficiency Reports	Basis for Award

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