



Calhoun: The NPS Institutional Archive

Theses and Dissertations

Thesis and Dissertation Collection

2016-09

Impacts of transitioning from firm fixed price to fixed price incentive firm target contracts in PEO Missiles and Space

Makowski, Suzanne E.

Monterey, California: Naval Postgraduate School



Calhoun is a project of the Dudley Knox Library at NPS, furthering the precepts and goals of open government and government transparency. All information contained herein has been approved for release by the NPS Public Affairs Officer.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>



**NAVAL
POSTGRADUATE
SCHOOL**

MONTEREY, CALIFORNIA

JOINT APPLIED PROJECT

**IMPACTS OF TRANSITIONING
FROM FIRM FIXED PRICE TO FIXED
PRICE INCENTIVE FIRM TARGET
CONTRACTS IN PEO MISSILES AND
SPACE**

September 2016

**By: Suzanne E. Makowski
Brandi M. Ricketts
Shannon M. Tidwell**

**Advisors: Charles K. Pickar
Brad R. Naegle**

Approved for public release. Distribution is unlimited.

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE September 2016	3. REPORT TYPE AND DATES COVERED Joint applied project		
4. TITLE AND SUBTITLE IMPACTS OF TRANSITIONING FROM FIRM FIXED PRICE TO FIXED PRICE INCENTIVE FIRM TARGET CONTRACTS IN PEO MISSILES AND SPACE			5. FUNDING NUMBERS	
6. AUTHOR(S) Suzanne E. Makowski, Brandi M. Ricketts, and Shannon M. Tidwell				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB number ____N/A____.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (maximum 200 words) The objective of this project is to analyze the impacts to major weapon systems programs in Program Executive Office (PEO) Missiles and Space as a result of transitioning from firm fixed price (FFP) contracts to fixed price incentive firm target (FPIF) contracts. This project presents an in-depth examination of FFP and FPIF contract types, including definitions, profit mechanisms, and advantages and disadvantages associated with each type. This project reviews three iterations of Better Buying Power, with a specific focus on profitability and the use of FPIF contracts. The project presents and analyzes data collected through interviews with PEO Missiles and Space program management and contracting personnel who support programs that have transitioned from FFP to FPIF. The project also examines defense industry profitability and considers the perspective of defense contractors regarding Department of Defense profit policy. The analysis results indicate that the PEO is appropriately applying guidance for choosing FPIF contracts in follow-on production, and that there are both benefits and challenges associated with FPIF contracts. Recommendations include continuing to assess FPIF use for production programs, obtaining actual cost data, and improving incentive contracting workforce training. Further research on the longer-term effects of transitioning to FPIF is recommended.				
14. SUBJECT TERMS firm fixed price, FFP, fixed price incentive firm target, FPIF, incentive, Better Buying Power			15. NUMBER OF PAGES 105	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release. Distribution is unlimited.

**IMPACTS OF TRANSITIONING FROM FIRM FIXED PRICE TO FIXED
PRICE INCENTIVE FIRM TARGET CONTRACTS IN PEO MISSILES AND
SPACE**

Suzanne E. Makowski, Civilian, Department of Army
Brandi M. Ricketts, Civilian, Department of Army
Shannon M. Tidwell, Civilian, Department of Army

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN PROGRAM MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
September 2016**

Approved by: Charles K. Pickar, Ph.D.

Brad R. Naegle

Brad R. Naegle, Academic Associate
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

IMPACTS OF TRANSITIONING FROM FIRM FIXED PRICE TO FIXED PRICE INCENTIVE FIRM TARGET CONTRACTS IN PEO MISSILES AND SPACE

ABSTRACT

The objective of this project is to analyze the impacts to major weapon systems programs in Program Executive Office (PEO) Missiles and Space as a result of transitioning from firm fixed price (FFP) contracts to fixed price incentive firm target (FPIF) contracts. This project presents an in-depth examination of FFP and FPIF contract types, including definitions, profit mechanisms, and advantages and disadvantages associated with each type. This project reviews three iterations of Better Buying Power, with a specific focus on profitability and the use of FPIF contracts. The project presents and analyzes data collected through interviews with PEO Missiles and Space program management and contracting personnel who support programs that have transitioned from FFP to FPIF. The project also examines defense industry profitability and considers the perspective of defense contractors regarding Department of Defense profit policy. The analysis results indicate that the PEO is appropriately applying guidance for choosing FPIF contracts in follow-on production, and that there are both benefits and challenges associated with FPIF contracts. Recommendations include continuing to assess FPIF use for production programs, obtaining actual cost data, and improving incentive contracting workforce training. Further research on the longer-term effects of transitioning to FPIF is recommended.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	PURPOSE.....	1
B.	BACKGROUND	2
C.	RESEARCH QUESTIONS	4
D.	METHODOLOGY	4
E.	SCOPE AND LIMITATIONS.....	5
F.	ORGANIZATION BY CHAPTER	5
G.	BENEFITS OF STUDY.....	6
II.	CONTRACT TYPE AND BETTER BUYING POWER.....	7
A.	INTRODUCTION OF CONTRACT TYPE	7
1.	Fixed-Price and Cost-Reimbursement Contracts	7
2.	Factors in the Selection of Contract Type	9
B.	FIRM-FIXED PRICE CONTRACTS.....	11
1.	Definition and Application.....	11
2.	Profit Mechanism.....	13
3.	Advantages and Disadvantages of FFP Type Contracts	14
C.	FIXED-PRICE INCENTIVE (FIRM TARGET) CONTRACTS	21
1.	Definition and Application.....	21
2.	Profit Mechanism.....	23
3.	Advantages and Disadvantages of FPIF Type Contracts.....	26
D.	BETTER BUYING POWER AND FPIF CONTRACTS	29
1.	BBP 1.0.....	30
2.	BBP 2.0.....	30
3.	BBP 3.0.....	32
III.	DATA AND ANALYSIS	35
A.	INTRODUCTION.....	35
B.	THE PROGRAMS.....	36
1.	Program A	36
2.	Program B.....	36
3.	Program C	36
4.	Program D	36
C.	DISCUSSION OF DATA COLLECTED	37
1.	Program Background	37
2.	The Impacts of the Transition	38
D.	DATA ANALYSIS	43

1.	Overview of the Transition from FFP to FPIF	43
2.	Impetus for the Transition from FFP to FPIF	44
3.	Challenges Resulting from the Transition to FPIF.....	44
4.	Benefits Resulting from the Transition to FPIF.....	45
IV.	THE “WAR ON PROFIT”: A CORPORATE PERSPECTIVE	47
A.	INTRODUCTION.....	47
B.	HISTORICAL AND POLITICAL CLIMATE.....	47
C.	PROFIT AND THE DEFENSE INDUSTRY	47
1.	Definition and Guidance.....	48
2.	What Is Too Much Profit?	49
3.	Analysis of Defense Industry Profits	49
D.	DEFENSE CONTRACTORS’ PERSPECTIVE AND EFFECTS OF PROFIT POLICY	52
1.	Benefits Received from Contracting with the Government	52
2.	Resulting Effects of Profit Policy	54
E.	SUMMARY	59
V.	CONCLUSIONS AND RECOMMENDATIONS.....	61
A.	CONCLUSIONS TO RESEARCH QUESTIONS.....	61
B.	RECOMMENDATIONS.....	66
	APPENDIX A. COMPARISON OF MAJOR CONTRACT TYPES	71
	APPENDIX B. INTERVIEW QUESTIONS	73
	APPENDIX C. INTERVIEW RESULTS.....	75
1.	PROGRAM A.....	75
2.	PROGRAM B.....	77
3.	PROGRAM C.....	79
4.	PROGRAM D.....	80
	LIST OF REFERENCES.....	83
	INITIAL DISTRIBUTION LIST	89

LIST OF FIGURES

Figure 1.	Cost Risk and Contract Type Relative to Acquisition Life Cycle and Requirements Definition. Source: Defense Acquisition University (2012).....	8
Figure 2.	Government and Contractor Risk Assumption by Contract Type. Source: Cuskey (2015).....	9
Figure 3.	Four Cost and Profit Scenarios under a Hypothetical FFP Contract	14
Figure 4.	Linear Representation of Realized Profit Relative to Actual Cost under a Hypothetical FFP Contract.....	14
Figure 5.	Four Cost and Profit Scenarios under a Hypothetical FPIF Contract	25
Figure 6.	Linear Representation of Realized Profit Relative to Actual Cost under a Hypothetical FPIF Contract	25
Figure 7.	Attributes of Studied Programs.....	37
Figure 8.	Hypothetical Funding Scenario for Program D.	43
Figure 9.	1980-2013 Defense Index Profit Margins Compared to Various S&P Indices. Source: Chandler (2014).	50
Figure 10.	The Yacht “Change Order” with its dinghy “Original Contract.” Source: Buckshon (2009).....	54

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	Summary of Interview Findings of Program Impacts Resulting from the Transition from FFP to FPIF.....	38
Table 2.	Program A Impacts of Transitioning from FFP to FPIF.....	76
Table 3.	Program B Impacts of Transitioning from FFP to FPIF	78
Table 4.	Program D Impacts of Transitioning from FFP to FPIF.....	81

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

ACC	Army Contracting Command
AMRAAM	Advanced Medium Range Air-to-Air Missile
BBP	Better Buying Power
C&L/TASC	Coopers & Lybrand/TASC, Inc.
CAS	Cost Accounting Standards
CPAF	Cost-Plus-Award-Fee
CPFF	Cost-Plus-Fixed-Fee
CPIF	Cost-Plus-Incentive-Fee
CS&CSS	Combat Support and Combat Service Support
CSDR	Cost and Software Data Reporting
DAU	Defense Acquisition University
DBB	Defense Business Board
DCAA	Defense Contract Audit Agency
DFARS	Defense Federal Acquisition Regulation Supplement
DOD	Department of Defense
DPAP	Defense Procurement Acquisition Policy
EMD	Engineering and Manufacturing Development
EVMS	Earned Value Management System
FAR	Federal Acquisition Regulation
FFP	Firm-Fixed Price
FPEA	Fixed-Price Contracts with Economic Price Adjustment
FPIF	Fixed-Price Incentive (Firm Target)
FPIS	Fixed-Price Incentive (Successive Target)
FPR	Fixed-Price with Price Redetermination
FRP	Full Rate Production
GAO	Government Accountability Office
GCS	Ground Combat Systems
JLTV	Joint Light Tactical Vehicle
LRIP	Low Rate Initial Production
MDAP	Major Defense Acquisition Program

OSD	Office of the Secretary of Defense
OUSD (AT&L)	Office of the Under Secretary of Defense for Acquisition, Technology & Logistics
PCO	Procuring Contracting Officer
PEO	Program Executive Office
PGI	Procedures, Guidance and Information
R&D	Research and Development
S&P	Standard & Poor's
TD	Technology Demonstration
USD (AT&L)	Under Secretary of Defense for Acquisition, Technology & Logistics

I. INTRODUCTION

A. PURPOSE

The Department of Defense's (DOD) use of fixed-price-incentive (firm target) (FPIF) contracts has been increasing as a result of the advent of the Better Buying Power (BBP) initiatives in 2010. The purpose of this project is to examine the impacts to selected DOD programs as a result of transitioning to FPIF contracts from another contract type, firm-fixed price (FFP). This project will first present and review information on various contract types, with particular attention paid to an in-depth examination of FFP and FPIF contract types. Then, this project will define these contract types, depict acquisition scenarios in which each of these contract types apply, and describe the profit mechanism of each type. This project will also delve into advantages and disadvantages associated with FFP and FPIF contracts.

This project will present a literature review of the three iterations of BBP from its inception in 2010 through its most current iteration, BBP 3.0, which was promulgated in 2015. It will examine BBP's major focus areas and principal actions as they emphasize the use of FPIF contracts and relate selection of contract type to aligning profitability with DOD acquisition objectives. It also examines defense contractors' perspectives of the BBP initiatives and their opinions on the increasing use of FPIF contracts.

In order to determine the impacts of the transition in contract type, this project will collect data on programs within Program Executive Office (PEO) Missiles and Space that have made the change from FFP to FPIF. This data will be gathered through personal interviews with subject matter experts within the PEO and the supporting contracting activity, including program management personnel and contracting officers. The information will be analyzed to determine the conditions that prompted the change in contract type. In addition, the information will be evaluated to draw conclusions about the benefits and challenges presented by the transition.

B. BACKGROUND

The 1908 airplane contract between the U.S. government and the Wright brothers has often been cited as one of the first incentive-type contracts. Under that \$25,000 contract, the Government incentivized performance of the aircraft with the promise of extra fee: the Government would pay the Wright brothers an additional \$2,500 of fee for every mile per hour that the aircraft's speed exceeded the target of 40 miles per hour. The brothers would lose \$2,500 of fee for each mile per hour that the aircraft's speed fell short of the target (Hildebrandt, 1998). Although contract types and their applications tend to fall in and out of favor as acquisition trends shift, this means the government has been using incentive contracts to motivate contractor productivity and performance for over a century. In particular, fixed price incentive contracts can be an effective method of encouraging contractors to control or reduce costs and improve technical performance by providing them the opportunity to share in a percentage of the benefit.

The 2005 Government Accountability Office (GAO) report *DOD Has Paid Billions in Award and Incentive Fees Regardless of Acquisition Outcomes* found that FPIF contracts represented only 0.8% of DOD contracting actions greater than \$25,000 in fiscal years 1999–2003. More significantly, the GAO also found that some of the FPIF contracts it examined significantly overran their projected target costs, fared poorly at motivating cost-control behavior, and failed to meet contract performance and schedule targets. This GAO report, along with other reports demonstrating inefficiencies in government contracting, prompted President Barack Obama in 2009 to issue a “Memorandum for the Heads of Executive Departments and Agencies” expressing a preference for fixed-price type contracts and directed the development of guidance to “govern the appropriate use and oversight of all contract types, in full consideration of the agency’s needs, and to minimize risk and maximize the value of Government contracts” (Obama, 2009).

One year later, Ashton Carter, then-Under Secretary of Defense for Acquisition, Technology and Logistics (USD [AT&L]), issued a memorandum titled “Better Buying Power: Mandate for Restoring Affordability and Productivity in Defense Spending,” which aimed to improve the way the DOD conducts business and deliver better value for

taxpayer dollars. BBP's overarching objective was to conduct DOD acquisitions more efficiently, with the ultimate goal of obtaining "two to three percent net annual growth in warfighting capabilities without incurring a commensurate budget increase by identifying and eliminating unproductive or low-value-added overhead; in effect, doing more without more" (Carter, 2010a, p. 2). As BBP evolved through three iterations over the next five years, one of its consistently stated principal actions has been to increase the use of FPIF type contracts.

FPIF contracts are most appropriate in the late development or early production stages of an acquisition program's life cycle. However, the use of FPIF contracts might also be indicated during the later stages of the production phase of a program in certain circumstances. Although we would generally expect system design, production processes, and of course, cost of performance to be well established at this phase of the life cycle, leading us to choose FFP contracts during production, this is not always the case. Production uncertainties may exist, such as risk due to a diminishing supplier base or potential inefficiencies resulting from breaks in production. More often, however, the risks are related to cost concerns, such as unreliable cost forecasting, inadequacy of proposal audits, and noncompliant contractor systems (Kendall, 2013b). If the cost estimating environment is uncertain, such as when examination of actual cost outcomes indicates that the contractor significantly underran the negotiated price on the prior FFP production increment, an FPIF contract may be appropriate for future production. Furthermore, the Defense Federal Acquisition Regulation Supplement (DFARS) Procedures, Guidance and Information (PGI) states that it is not in the best interest of the government to use FFP contracts in a production phase when costs for efforts under previous FFP production contracts have varied by more than four percent from the costs that were negotiated at contract award (2016). All of these scenarios could cause the switch from FFP to FPIF.

C. RESEARCH QUESTIONS

The primary research question addressed in this project is, What are the impacts of transitioning defense acquisition programs from firm-fixed price (FFP) type contracts to fixed-price incentive (firm target) (FPIF) type contracts?

Subsidiary research questions include the following:

- What does existing guidance prescribe regarding circumstances when FPIF should be used in lieu of other contract types?
- Is current guidance appropriately applied when programs shift contract type from FFP to FPIF contract types?
- What benefits has the government realized as a result of the transition from FFP to FPIF contracts?
- What challenges or drawbacks result from the use of FPIF contracts?
- How do contractors view the DOD's increased focus on the use of incentive contracting?

D. METHODOLOGY

This project utilized two primary methodologies to address the research questions. Chapters II and IV are based on a literature review. The researchers reviewed current regulatory guidance in the Federal Acquisition Regulation (FAR), DFARS, and PGI, BBP memoranda and implementation guides, and various scholarly articles to develop Chapter II, which imparts the background information necessary to understand the major contract types being studied and the guidance that is encouraging the transition from FFP to FPIF. Chapter IV is based on a literature review of readings conveying various corporate perspectives on Better Buying Power and DOD profit policy.

In order to examine the government perspective on acquisition programs that have transitioned from FFP to FPIF, the researchers developed a questionnaire composed of 18 questions which targeted information related to actual experience with this contract-type transition. The questionnaire was delivered through personal communication with interview subjects. Chapter III presents and analyzes the questionnaire responses and interview results. The interviews were conducted with subject matter experts in contracting and program management for PEO Missiles and Space programs. Programs

which met the project's criteria were identified with the assistance of Barry Pike, the program executive officer for Missiles and Space.

E. SCOPE AND LIMITATIONS

This project examines programs that have changed contract type from FFP to FPIF and the effects resulting from that transition. Therefore, this project focuses on these two contract types. It will not address fixed price incentive (successive target) (FPIS) contract types, nor any cost-type incentive contracts. This project also will not investigate programs that have transitioned to FPIF contracts from any contract type other than FFP.

As discussed in the Methodology section, this project presents data gathered and analyzed related to weapon system programs in PEO Missiles and Spaces. The data is presented in aggregate, and no data or observations are directly attributed to any individual program. Programs and contractors are identified only by generic designators (e.g., Program A, Contractor 1) in order to avoid disclosure of contractors' proprietary or competition sensitive information.

This project focuses only on weapon systems under the purview of PEO Missiles and Spaces. Initially, we intended to conduct an analysis of a wider variety of programs. We surveyed contracting professionals at Army Contracting Command (ACC) -Warren who support PEO Ground Combat Systems (GCS) and PEO Combat Support and Combat Service Support (CS&CSS). Combined, PEO GCS and PEO CS&CSS are comprised of combat weapon systems, tactical wheeled vehicles, and numerous other major defense programs. Although we discovered a handful of programs currently utilizing FPIF contracts within PEO GCS and PEO CS&CSS, none transitioned from previous use of FFP, and therefore did not meet the criteria of the project's scope.

F. ORGANIZATION BY CHAPTER

Chapter II provides a definition and general description of the two broad contract types, fixed price and cost reimbursement, as defined in the FAR. In particular, this chapter presents an in-depth examination of FFP and FPIF contract types, including their

definitions, acquisition scenarios in which these contract types apply, and the operation of their profit mechanisms. This chapter also describes advantages and disadvantages associated with FFP and FPIF contracts. Finally, this chapter discusses Better Buying Power from its inception in 2010 through its most current iteration, BBP 3.0, in relation to its emphasis on FPIF contracts.

Chapter III communicates and synthesizes the data collected during our research. This chapter describes the conditions that have motivated programs to switch from FFP to FPIF contracts, and describes the perspectives of DOD acquisition professionals on the benefits, challenges, and other impacts of transitioning their programs from FFP to FPIF contracts.

Chapter IV discusses the contractor perspective of DOD's profit policy resulting from the BBP initiative to align profitability of defense acquisition programs more tightly with DOD goals. This chapter presents an analysis of defense industry profit margins, the potential effects of what contractors perceive to be the DOD's "war on profit," and how FPIF contracts might address this issue.

Chapter V presents conclusions and recommendations, as informed by the information, literature, and data analyzed in the preceding chapters. This chapter will provide the answers to the research questions introduced in Chapter I. Chapter V will also impart recommendations related to the application of FPIF contracts and recommendations for further research, particularly related to the longer-term effects of transitioning from FFP to FPIF contracts.

G. BENEFITS OF STUDY

Overall, this project aims to assist PEO Missiles and Space in determining the benefits achieved and challenges faced as programs move from FFP to FPIF. This project will assist other weapon system programs that are contemplating a similar transition to understand the positive and negative effects that may result from the switch to FPIF. This project also examines the appropriate circumstances for application of FPIF contracts and observes whether the studied programs are employing the FPIF contract type appropriately. Furthermore, the results of this study may help inform and refine guidance in future iterations, if any, of Better Buying Power.

II. CONTRACT TYPE AND BETTER BUYING POWER

A. INTRODUCTION OF CONTRACT TYPE

There are numerous contract types available to the Procuring Contracting Officer (PCO) that he or she can employ in the procurement of goods and services for the government. At the highest level, selection of contract type is about risk and reward. First, the most appropriate contract type for an effort must consider the degree of risk that the government and the contractor each have to bear and what is a reasonable balance between the parties. Second, with regard to reward, the contract type should be chosen with the purpose of motivating the contractor by providing a profit incentive for economical and efficient performance in achieving or exceeding the requirements of the contract (Office of the Under Secretary of Defense for Acquisition, Technology & Logistics [OUSD (AT&L)], 2016).

1. Fixed-Price and Cost-Reimbursement Contracts

There are two overarching contract types: fixed-price and cost-reimbursement. Federal Acquisition Regulation (FAR) (2016) § 16.201 broadly defines fixed-price contracts as contracts that “provide for a firm price or, in appropriate cases, an adjustable price.” On the other hand, per FAR (2016) § 16.301-1, cost-reimbursement type contracts “provide for payment of allowable incurred costs, to the extent prescribed in the contract” and “establish an estimate of total cost for the purpose of obligating funds.” This FAR section further indicates that the contractor may not incur costs above the ceiling price estimate without obtaining approval from the PCO. Cost-reimbursement type contracts are appropriate in circumstances in which the contract requirements are not well-enough defined to facilitate the use of a fixed-price contract, including procurements for research and development (R&D), and during the early phases of the acquisition life cycle (i.e., Technology Demonstration [TD], Engineering and Manufacturing Development [EMD] and Low Rate Initial Production [LRIP]). Figure 1 depicts contract type and cost risk relative to stages of the acquisition life cycle and how well-defined the program’s requirements are.

COST RISK AND CONTRACT TYPE						
Cost Risk	High					Low
Requirement Definition	Vague					Well-defined
Production Stages	Concept Studies & Basic Research	Exploratory Development	Test/ Demonstration	Full-scale Development	Full Production	Follow-on Production
Contract Type	Varied	CPIF	CPIF, FPIF	CPIF, FPIF, or FFP	FFP, FPIF, or FPEPA	FFP, FPIF, or FPEPA

Figure 1. Cost Risk and Contract Type Relative to Acquisition Life Cycle and Requirements Definition. Source: Defense Acquisition University (2012).

The relative risk assumed by the government and the contractor, respectively, varies across the spectrum of contract types. At the cost-plus-fixed-fee end of the continuum, the government assumes the risk of cost and performance of the contractor. At the other end, the contractor assumes the majority of the risk under firm-fixed price contracts, where the contractor assumes complete responsibility for the cost of performance and the profit or loss that results (OUSD [AT&L], 2016). Figure 2 includes several sub-types under each of the two broad contract categories of fixed-price and cost-reimbursement. Fixed-price contract types include

- Firm-Fixed Price (FFP)
- Fixed-Price Contracts with Economic Price Adjustment (FPEA)
- Fixed-Price Contracts with Price Redetermination (FPR)
- Fixed-Price Incentive (Successive Target) (FPIS)
- Fixed-Price Incentive (Firm Target) (FPIF)

Likewise, cost-reimbursement type contracts can be further subdivided into more specific subtypes, including

- Cost Sharing
- Cost-Plus-Incentive-Fee (CPIF)

- Cost-Plus-Award-Fee (CPAF)
- Cost Contracts where the contractor receives no fee
- Cost-Plus-Fixed-Fee (CPFF)

Figure 2 depicts the risk assumed by the government and the contractor, with the contractor assuming maximum risk under an FFP contract at the upper left of the figure and the government assuming maximum risk under a CPFF contract in the lower right corner. The amount of risk assumed by the contractor decreases as the continuum of contract types is traversed. This can also be stated as the amount of risk transferred to the government increases as the spectrum moves from FFP to CPFF.

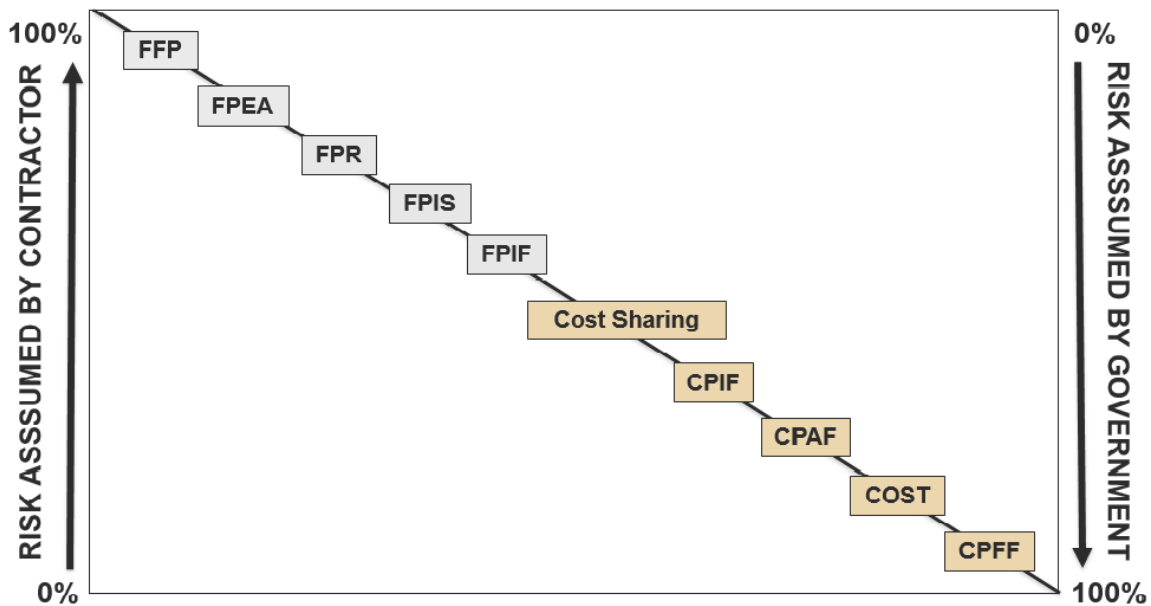


Figure 2. Government and Contractor Risk Assumption by Contract Type.
Source: Cuskey (2015).

2. Factors in the Selection of Contract Type

Selection of contract type is a complex matter and depends on numerous considerations. FAR (2016) § 16.104 lists 12 factors that the PCO should consider in the selection and negotiation of contract type:

(a) *Price competition.* Normally, effective price competition results in realistic pricing, and a fixed-price contract is ordinarily in the Government's interest.

(b) *Price analysis.* Price analysis, with or without competition, may provide a basis for selecting the contract type. The degree to which price analysis can provide a realistic pricing standard should be carefully considered. (See 15.404-1(b))

(c) *Cost analysis.* In the absence of effective price competition and if price analysis is not sufficient, the cost estimates of the offeror and the Government provide the bases for negotiating contract pricing arrangements. It is essential that the uncertainties involved in performance and their possible impact upon costs be identified and evaluated, so that a contract type that places a reasonable degree of cost responsibility upon the contractor can be negotiated.

(d) *Type and complexity of the requirement.* Complex requirements, particularly those unique to the Government, usually result in greater risk assumption by the Government. This is especially true for complex research and development contracts, when performance uncertainties or the likelihood of changes makes it difficult to estimate performance costs in advance. As a requirement recurs or as quantity production begins, the cost risk should shift to the contractor, and a fixed-price contract should be considered.

(e) *Combining contract types.* If the entire contract cannot be firm-fixed-price, the contracting officer shall consider whether or not a portion of the contract can be established on a firm-fixed-price basis.

(f) *Urgency of the requirement.* If urgency is a primary factor, the Government may choose to assume a greater proportion of risk or it may offer incentives tailored to performance outcomes to ensure timely contract performance.

(g) *Period of performance or length of production run.* In times of economic uncertainty, contracts extending over a relatively long period may require economic price adjustment or price redetermination clauses.

(h) *Contractor's technical capability and financial responsibility.*

(i) *Adequacy of the contractor's accounting system.* Before agreeing on a contract type other than firm-fixed-price, the contracting officer shall ensure that the contractor's accounting system will permit timely development of all necessary cost data in the form required by the proposed contract type. This factor may be critical—

(1) When the contract type requires price revision while performance is in progress; or

(2) When a cost- reimbursement contract is being considered and all current or past experience with the contractor has been on a fixed-price basis. See 42.302(a)(12).

(j) *Concurrent contracts*. If performance under the proposed contract involves concurrent operations under other contracts, the impact of those contracts, including their pricing arrangements, should be considered.

(k) *Extent and nature of proposed subcontracting*. If the contractor proposes extensive subcontracting, a contract type reflecting the actual risks to the prime contractor should be selected.

(l) *Acquisition history*. Contractor risk usually decreases as the requirement is repetitively acquired. Also, product descriptions or descriptions of services to be performed can be defined more clearly.

The list of considerations in the FAR is not all-inclusive, but it clearly illustrates that the choice of contract type requires careful thought and analysis of the procurement facts. As previously discussed, a full complement of fixed-price and cost-reimbursement contract types is available to the PCO to fit various acquisition scenarios. This paper focuses on two particular fixed-price contract types, firm-fixed price (FFP) and fixed-price incentive (firm target) (FPIF). An in-depth discussion of each follows in the next two sections.

B. FIRM-FIXED PRICE CONTRACTS

The following section defines the FFP contract type and discusses conditions where the FFP contract type is appropriate. This section also uses a hypothetical scenario of contract price and cost to explain the FFP profit mechanism, including a depiction of the slope of an FFP profit line. Finally, this section identifies some advantages and disadvantages associated with the FFP contract type.

1. Definition and Application

FAR (2016) § 16.202 defines an FFP contract as a contract whose price is not subject to any adjustment as a result of the contractor's incurred costs during its

performance of the contract. This section further explains that an FFP contract places maximum cost risk and responsibility, as well as the resulting profit (or loss) on the contractor. Regardless of the actual costs experienced by the contractor, an FFP contract obligates the contractor to provide the contracted supplies or services at the time, place, price, and quality level specified in the contract (Defense Acquisition University, 2012).

FAR (2016) § 16.202-2 discusses the application of FFP contracts and the circumstances in which their use is appropriate. FFP contracts are suitable for procuring commercial items—indeed, a fixed price type contract *must* be used when acquiring commercial supplies or services, as FAR (2016) § 16.301-3(b) prohibits the use of cost-type contracts to acquire commercial items. Volume 4 of Defense Acquisition University’s (DAU) *Contract Pricing Reference Guide* gives further conditions where the use of an FFP contract would be appropriate, including

- A well-defined requirement,
- A requirement that prospective contractors are skilled and experienced in accomplishing,
- Stable market conditions, and
- Financial risks to the government and contractor are otherwise insignificant (Defense Acquisition University, 2012).

Above all, one of the most important considerations in selecting an FFP contract is whether the contracting officer is able to establish fair and reasonable contract prices *at the time of contract award*, since the prices will not be subject to any subsequent adjustment as a result of contract performance. FAR (2016) § 16.202-2 details several possible pricing scenarios where the contracting officer can confidently establish FFP contract pricing, including

- Adequate price competition. In general, FAR (2016) § 15.403-1(c)(1) defines adequate price competition as existing when “Two or more responsible offerors, competing independently, submit priced offers that satisfy the Government’s expressed requirement.”
- Previous procurement history exists for the same or similar items where price reasonableness was supported by either adequate price competition or certified cost or pricing data.

- Cost or pricing information is available to permit the parties to reasonably estimate the probable costs of contract performance.
- The government can identify potential performance uncertainties and the parties can reasonably estimate the cost impact of those uncertainties, such that the contractor is willing to assume the risks involved and accept an FFP contract.

2. Profit Mechanism

This section examines the behavior of the profit mechanism under an FFP contract. The definition of an FFP contract in the previous section establishes that the contract price paid to the contractor for performance of the contract does not change regardless of the actual costs the contractor incurs to provide a deliverable in accordance with the agreed-upon terms of the contract (FAR [2016] § 16.202-1). This means that for every dollar of cost the contractor saves, it gains an extra dollar of profit. Conversely, for every dollar of cost incurred over its estimate to perform the contract, the contractor loses a dollar of profit. The amount of profit is limited only by the contract price. The amount of loss is theoretically unlimited.

Figure 3 depicts the actual cost, realized profit dollars, total price, and effective profit rate for four cost scenarios under a hypothetical FFP contract. The scenarios assume that the contract was awarded at a firm-fixed price of \$115, with an estimated cost of \$100 and estimated profit of \$15, or 15%. In the first scenario, the contractor's actual costs are equal to its original estimated costs, resulting in realized profit and an effective profit rate also equal to its original estimates. In the second scenario, the contractor performed more efficiently than originally anticipated and was able to achieve \$10 in cost savings as compared to its original estimate, which results in a \$10 increase in profit. The contractor's actual cost is equal to the contract price in the third scenario, resulting in zero profit dollars. Finally, the fourth scenario shows a contractor loss situation. The contractor experienced a cost overrun of \$30, which results in a dollar-for-dollar decrease to the contractor's profit. Because the original estimated profit was \$15, this means the contractor experiences a loss of \$15.

Cost Scenario	Actual Cost	Realized Profit	Total Price	Effective Profit Rate
Actual Cost = Estimated Cost	\$ 100	\$ 15	\$ 115	15.0%
Actual Cost < Estimated Cost	\$ 90	\$ 25	\$ 115	27.8%
Actual Cost = Firm Fixed Price	\$ 115	\$ 0	\$ 115	0.0%
Actual Cost > Estimated Cost	\$ 130	\$ (15)	\$ 115	-11.5%

Figure 3. Four Cost and Profit Scenarios under a Hypothetical FFP Contract

The ratio of realized profit relative to actual cost is graphically represented in Figure 4.

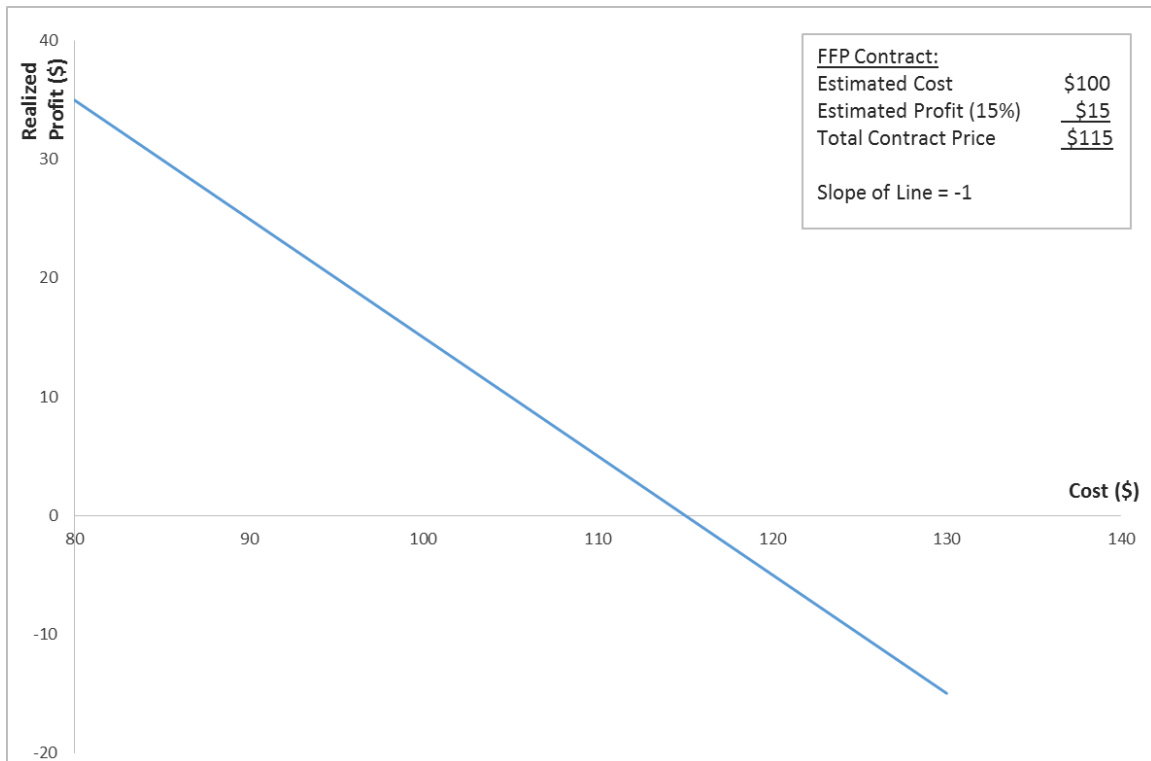


Figure 4. Linear Representation of Realized Profit Relative to Actual Cost under a Hypothetical FFP Contract

3. Advantages and Disadvantages of FFP Type Contracts

All contract types have advantages and disadvantages depending on the circumstances of the procurement. No contract type has a one-size-fits-all application. It

is tempting to think that FFP type contracts are mainly advantageous for the government because the contractor bears the risk and responsibility of the incurred costs of performance and the profit or loss it experiences as a result. The DAU Contract Pricing Reference Guide even states that the “Principal Risk to be Mitigated” of FFP contracts is “None. Thus, the contractor assumes all cost risk” (2012, Vol. 4, pp. 2-3) in their Comparison of Major Contract Types. However, this is a rather narrow view. We must consider all aspects of an acquisition to fully assess the advantages and disadvantages of FFP type contracts.

a. Advantages of FFP Type Contracts

This section discusses several advantages associated with FFP contracts, including the contractor’s incentive to control costs, certainty of the contract price, less contract administration, and less burdensome accounting system requirements.

(1) Incentive to Control Costs

FFP places maximum incentive on contractors to control costs. The contractor experiences a dollar-for-dollar benefit to its bottom line by improving efficiency and controlling the cost of performance. FFP contracts provide more motivation to the contractor to implement cost control measures than any other contract type, because it allows the contractor to keep the entire benefit of its cost reductions (as opposed to other contract types further down the spectrum where the contractor has to share the benefit of cost savings with the government).

(2) Price Certainty

FFP contracts have the advantage, by their very definition, of having a fixed contract price, regardless of contractor cost. The contractor can underrun or overrun its cost of performing the contract, but the price to the government does not change. This price certainty is especially desirable in times of diminishing budgets (Frick, 2013). It is very beneficial to the government to know exactly what it will pay for the supplies and services for which it has contracted, and that no further outlay will be required on the contract than what is already known. FFP contracts are the only contract type that has this

trait. Cost-reimbursement contracts and all other fixed-price type contracts include the potential for future price redetermination.

(3) Less Contract Administration

Per FAR (2016) § 16.202-1, FFP contracts create a minimum administrative burden upon the government. Under an FFP contract, the government is not required to monitor the contractor's cost of performance as it must under a cost-reimbursement or fixed-price incentive type contract. There is no need to track the contractor's progress toward meeting performance or schedule incentives. The contracting officer does not have to exercise surveillance over the number of labor hours the contractor is working under a service contract – the contractor is obliged to perform the service to the specification in the contract's scope of work regardless of the number of hours it actually requires to accomplish. Eliminating the government's responsibility to monitor contractor cost and performance reduces administrative burden as well as procurement cost to the government (Coombs, 2013).

(4) Adequate Accounting System Not Required

A firm-fixed price contract does not require the contractor to have an adequate accounting system. However, for any other contract type, the PCO must confirm that the contractor has an accounting system that “will permit timely development of all necessary cost data in the form required by the proposed contract type” (FAR [2016] § 16.104(i)). Adequate contractor accounting systems are required for fixed-price incentive, fixed-price redetermination, and all cost-reimbursement type contracts. Ensuring the adequacy of a contractor's accounting system is no small task. The PCO typically does not have the accounting expertise to perform the accounting system review himself and therefore delegates the cognizant Defense Contract Audit Agency (DCAA) field audit office to audit the contractor's accounting system. DCAA will perform an accounting system audit and provide findings to the PCO to support the PCO's adequacy determination.

Establishing and maintaining an adequate accounting system can be onerous for the contractor, as well. DFARS (2016) § 252.242-7006, Accounting System

Administration, prescribes 18 criteria that the contractor's accounting system must meet. These criteria mainly focus on appropriate internal controls, and the system's ability to segregate costs by type, contract, and cost objective. The criteria also require the contractor to maintain accounting practices in accordance with the Cost Accounting Standards (CAS) Board. Administering an accounting system that meets all 18 criteria is a complex and expensive endeavor. Even some of the largest and most experienced defense contractors find it difficult to maintain an adequate accounting system.

b. Disadvantages of FFP Type Contracts

This section identifies several disadvantages associated with FFP contracts. FFP contracts may present risks associated with price premiums, contractor cost of performance, and unclear requirements definition. FFP contracts also lack flexibility when requirements change. In addition, FFP contracts are not appropriate for R&D type efforts.

(1) Price Premium Risk

Although it is true that the government will not pay more than the negotiated contracted price under an FFP contract, it would be short-sighted to assume this means there is no cost risk to the government. A sensible contractor will consider the likelihood that its actual cost of performance may differ from the estimated cost of performance and price some uncertainty into its proposed price. Although some FFP contracts will require an in-depth analysis of certified cost or pricing data, there exists a real possibility that the government will pay an unknown price premium under an FFP contract to mitigate the contractor's cost risk. Some opinions estimate that larger fixed-price contracts likely include a 10 to 15 percent price premium to help the contractor manage its cost risk (Frick, 2013).

(2) Contractor Cost Risk

An FFP contract shifts maximum cost risk to the contractor. The government will never pay more than the contracted price regardless of what costs the contractor actually incurs. Therefore, the cost risk to the contractor is theoretically limitless. A contractor who is experiencing large cost overruns may eventually become unable to perform the

contract, potentially resulting in the government terminating the contract for default. A substantial loss could weaken the contractor's overall financial performance and negatively affect its corporate stock prices. If the loss were severe enough, it could even bankrupt the contractor, further resulting in the decline of the DOD's industrial base.

Additionally, because contractors bear the maximum burden of cost risk under FFP contracts, this contract type has the potential to exclude small and medium-sized businesses who cannot afford to bear cost risk because of their more limited financial resources (Defense Business Board, 2010). This could have the unintended consequences of inhibiting competition and small business participation for government contracts. The competition for the Joint Light Tactical Vehicle (JLTV) EMD contract is one such example. The EMD phase of the JLTV program required vehicle and trailer prototypes, systems engineering, and substantial test support. This FFP effort was solicited under full and open competition with the intent to award up to three contracts. Notably, the solicitation cautioned bidders that proposals priced in excess of \$65 million would be considered unaffordable, which could be grounds for rejection from the competition (Feickert, 2016). This was despite some internal government cost estimates that indicated the effort could not be fully performed within this affordability ceiling. In addition, the DOD's FY 2012 Budget Request for \$243.9 million (Department of Defense [DOD], 2011) indicates that the Joint Program Office believed it needed more funding - \$243.9 million divided among three contracts equates to approximately \$81 million per contract, \$16 million in excess of the \$65 million affordability cap. When the solicitation closed, offers from seven bidders were received—six from huge defense contractors such as Lockheed Martin and BAE Systems, and only one from a small business, Hardwire, LLC. (Joint Light Tactical Vehicle, n.d.). It is not surprising that there was not more interest from small businesses, as any overrun on an FFP contract is the sole responsibility of the contractor. While \$16 million might be considered a rounding error to a multi-billion dollar company, it would be a substantial—potentially bankrupting—overrun for a small business to absorb.

(3) Risk of Unclear Requirements Definition

It is essential that an FFP contract very clearly define the requirements that the contractor is obligated to meet. If requirements are poorly defined, it is possible that the contractor may perform the work as specified in the contract, but the resulting supply or service may not meet the government's need because the government adequately define its requirement in the contract's statement of work (Garrett, 2009). Vague contract language, or ambiguity, leaves the government exposed to the risk that the contractor will adopt an interpretation that allows it to meet the letter of the contract at the minimum effort required, resulting in a level of performance lower than that which was desired by the government. Any ambiguity will be interpreted against the government, as per the concept of *contra proferentem*, which states that any contract ambiguities shall be interpreted against the drafter—that is, against the government (Contract and Fiscal Law Department, The Judge Advocate General's Legal Center and School, 2014). As long as its interpretation of the requirement is reasonable, the ambiguity will be interpreted in the contractor's favor, potentially resulting in a deliverable that is less than what the government desired but is still in accordance with the contract.

(4) Lack of Flexibility in Changing Requirements

In addition to ambiguous requirements, changing requirements can also inhibit the government from efficiently administering FFP contracts. If a program experiences an unanticipated growth or decline in its requirements, an FFP contract is not flexible enough to respond without modification (Coombs, 2013). Modifications, as well as partial or full terminations for convenience, resulting from post-award requirements changes add to the government's administrative and cost burden.

(5) Not Appropriate for Developmental Efforts

FFP contracts are appropriate in circumstances where the government's requirement is well-defined and costs can be estimated with reasonable accuracy at the time of contract award. By their very nature, R&D type efforts generally do not meet these criteria. Some R&D efforts for major weapon systems may include validating design approaches, refining requirements, developing prototypes, and integrating systems

and subsystems (DOD, 2013). These types of efforts inevitably lead to changes in requirements, which further create uncertainty in pricing. FAR (2016) § 35.006 states that “the absence of precise specifications and difficulties in estimating costs with accuracy (resulting in a lack of confidence in cost estimates) normally precludes using fixed-price contracting for R&D.”

Historically, attempts to use FFP contracts for the development of major weapon systems have been dismal failures, resulting in program cost growth, restructuring and cancellation; contractors bearing hundreds of millions of dollars of cost overruns; and lengthy and expensive litigation (Defense Business Board, 2010). One such case is the Advanced Medium Range Air-to-Air Missile (AMRAAM) program. The Air Force’s acquisition strategy to competitively award an FFP contract, as well as “overly optimistic estimates of the complexity and cost of the missile,” resulted in numerous schedule delays, unmet technical performance requirements, and the absorption of \$255 million in losses related to cost overruns by the contractor, Hughes Aircraft Company (Government Accountability Office, 1987, p. 17).

The services also used FFP contracts for numerous aircraft development programs in the mid-1980s, including the V-22, F-14D, T-45, T-46, and C-17, all of which suffered cost, schedule, and performance difficulties correlated to the use of FFP contracts for developmental efforts (Defense Business Board, 2010). The most notorious, however, was the Navy’s FFP development of the A-12 aircraft. The A-12 Avenger II was a stealth aircraft with unproven technology, and its development was plagued with schedule woes, technical concerns, and cost overruns in excess of \$1 billion. The contractors, General Dynamics and McDonnell Douglas (later acquired by Boeing), maintained the FFP contract was flawed, stating, “The outline of the work was such that it required considerable more effort, more technology and more investment than had been originally specified” (Schmitt, 1991, para. 19). The Navy’s remedy was to terminate the contract for default and demand \$1.3 billion in restitution. This action resulted in 23 years of arguing legal battles with contractors and countless millions of taxpayer dollars spent on litigation. The A-12 was never built, and the government ended up with only \$400

million in hardware and program discounts in compensation instead of the more than \$1 billion incurred in cost overruns (Thompson, 2014).

C. FIXED-PRICE INCENTIVE (FIRM TARGET) CONTRACTS

FAR (2016) § 16.204 defines a fixed-price-incentive contract as “a fixed-price contract that provides for adjusting profit and establishing the final contract price by a formula based on the relationship of final negotiated total cost to total target cost.” There are two types of fixed-price incentive contracts: fixed-price-incentive (firm target) (FPIF) and fixed-price-incentive successive targets (FPIS). FPIS-type contracts are outside the scope of this research paper and will not be discussed further. The following section describes FPIF contracts, their applications, profit mechanism, and advantages and disadvantages in further detail.

1. Definition and Application

FAR (2016) § 16.403-1(a) defines FPIF contracts as a contract type that

specifies a target cost, a target profit, a price ceiling (but not a profit ceiling or floor), and a profit adjustment formula. These elements are all negotiated at the outset. The price ceiling is the maximum that may be paid to the contractor, except for any adjustment under other contract clauses. When the contractor completes performance, the parties negotiate the final cost, and the final price is established by applying the formula. When the final cost is less than the target cost, application of the formula results in a final profit greater than the target profit; conversely, when final cost is more than target cost, application of the formula results in a final profit less than the target profit, or even a net loss. If the final negotiated cost exceeds the price ceiling, the contractor absorbs the difference as a loss.

DAU’s *Contract Pricing Reference Guide*, Volume 4, states that FPIF contracts should be used when the parties can establish a ceiling price that sufficiently covers the most likely risks inherent in contract performance, as well as a profit sharing ratio that adequately incentivizes the contractor to control the costs it incurs to achieve contract performance objectives. The Guide further states that the “contractor is obliged to provide an acceptable deliverable” (2012, Vol. 4, pp. 3-4) in accordance with the contract

schedule and scope of work, for which it will be paid at or below the ceiling price commensurate with costs incurred.

FAR (2016) § 16.403 discusses the general application of FPIF contracts, and the DFARS and DFARS Procedures, Guidance and Information (PGI) give more specifics about circumstances in which use of FPIF contracts is appropriate. Broadly, FPIF contracts are appropriate in circumstances where an FFP contract would not be suitable, and when the contractor's assumption of cost responsibility provides a positive incentive to control contract cost and performance through the opportunity for increased profit margins. Although the contract's final price is not determinable at contract award, contract requirements and cost of performance must be certain enough that the parties can negotiate all FPIF elements at the outset, including target cost, target profit, ceiling price, and the share ratios for cost underruns and overruns. This means that in many cases, FPIF will not be appropriate for programs in the TD phase or even the EMD phases of their life cycle, when many of the program efforts will be of an R&D nature. History shows that over the last two decades, the average Major Defense Acquisition Program (MDAP) experienced cost overruns of nearly 30 percent during EMD (Kendall, 2013b). This degree of cost uncertainty is too high to expect the contractor to bear or share. However, Kendall believes there can be limited situations in which FPIF can be appropriately employed in the EMD phase. If an MDAP's requirements are stable and mature, technical risk is low, and the competing contractors are both experienced and financially solvent enough to absorb cost overruns, an FPIF contract type may be a reasonable choice during EMD (2013b).

DFARS (2016) § 216.403-1(b)(1) directs contracting officers to give particular consideration to using an FPIF contract when a program is moving from development to the production phase of its life cycle. Kendall states that FPIF becomes a more natural fit as an MDAP enters low-rate initial production (LRIP). Like MDAPs during EMD, over the last 20 years, MDAPs during LRIP have experienced cost overruns. However, the historical average LRIP overrun is slightly less than ten percent. Kendall put forward that this is a reasonable level at which to expect contractors and the government to share cost risk by using an FPIF contract type (Kendall, 2013b).

Finally, Kendall states that FPIF contracts may be appropriate in certain MDAPs during full-rate production (FRP) (2013b). Although we would typically expect requirements and cost of performance to be certain enough to utilize an FFP-type contract, in some instances, FPIF may actually be a better fit. Sometimes, production parameters may be uncertain, such as the potential for inefficiencies resulting from breaks in production or risk due to a diminishing supplier base. More often, the risks are related to cost concerns, such as inadequate proposal audits, noncompliant contractor accounting and estimating systems, and unreliable cost forecasting (Kendall, 2013b). If the cost estimating environment is uncertain, such as when examination of actual cost outcomes indicates that the contractor significantly underran the negotiated price on the prior production increment, an FPIF contract may be advisable for a future increment. Definitively, DFARS PGI 216.403-1(1)(ii)(B) states that it is not in the best interest of the government to use FFP contracts in a production phase if costs are not stable, a circumstance further defined as potentially occurring when costs for efforts under previous FFP production contracts have varied by more than four percent from the costs that were negotiated at contract award (2016).

2. Profit Mechanism

This section examines the behavior of the profit mechanism under an FPIF contract. The definition of an FPIF contract in the previous section establishes that the contract price paid to the contractor for performance of the contract will depend on the contractor's actual cost of performance in relation to the incentive parameters established at contract award, including target cost, target profit, ceiling price, and share ratio. In order to demonstrate how profit and final contract price are calculated, we must first define these terms.

- **Target Cost:** The target cost represents what the government and contractor agree at the outset is the most likely estimate of the total cost of contract performance.
- **Target Profit:** The target profit is the negotiated reasonable rate of return, and represents the profit the contractor will earn if the actual cost of contract performance equals the target cost.

- **Ceiling Price:** The contract's ceiling price represents the maximum price paid to the contractor, regardless of actual costs incurred for contract performance. The government may pay less, but will never pay more than the contract's ceiling price. All cost overruns above the ceiling price are the obligation of the contractor.
- **Share Ratio:** The share ratio represents the proportion of cost overrun or underrun above or below the target cost to be allocated between the government and the contractor. The government share is always the first number expressed in the ratio, and the contractor share is represented by the second number (OUSD [AT&L], 2016). For example, in a 60/40 share ratio, the government shares 60% of an overrun, while the contractor shares 40% of that overrun.

Figure 5 depicts the actual cost, target profit, share of underrun or overrun, actual profit, and effective profit rate for four cost scenarios under a hypothetical FPIF contract. The scenarios assume that the contract was awarded at a target cost of \$100, with a target profit of \$15 and a ceiling price of \$120. This simple example assumes a 50/50 government/contractor share ratio for both cost overruns and cost underruns. This scenario is purposely simple for the purposes of illustrating the FPIF profit mechanism. In reality, an FPIF contract may be far more complex than this example. The parties may negotiate different share ratios for cost underruns and cost overruns – for example, 40/60 for underruns and 70/30 for overruns. Furthermore, per FAR (2016) § 16.402, the parties may also agree to multiple incentives in addition to cost, such as incentivizing certain technical performance objectives or delivery schedule. Multiple incentive arrangements are permissible as long as cost is incentivized and the multiple-incentive arrangement motivates the contractor to strive for excellent results in all incentivized areas. These scenarios add complexities that are outside the scope of this example.

In the first scenario, the contractor's actual costs are equal to the original negotiated target costs, resulting in realized profit equal to the target profit. The contractor performed more efficiently than originally anticipated in the second scenario, resulting in a \$10 cost *underrun* as compared to the target cost; a 50% share of this underrun is \$5, which results in \$20 of actual profit (\$15 target profit + \$5 share of cost underrun). In the third scenario, the contractor experienced a \$10 cost *overrun* compared to the target cost but its actual cost is less than the ceiling price. A 50% share of this overrun is \$5, which results in \$10 of actual profit (\$15 target profit - \$5 share of cost

overrun). Finally, the fourth scenario depicts a situation in which the actual cost of contract performance exceeded the ceiling price. The contractor experienced a cost overrun of \$30; 50% of this overrun is \$15. Following the mathematics of the previous examples, we might assume this means the contractor has an actual profit of \$0 (\$15 target profit - \$15 share of cost overrun). However, the contractor is limited to receiving no more than the contract's ceiling price. This means the contractor experiences a loss of \$10 (\$120 ceiling price - \$130 actual cost).

Cost Scenario	Actual Cost	Target Profit	Share of Underrun/ (Overrun)	Actual Profit	Total Price	Effective Profit Rate
Actual Cost = Target Cost	\$ 100	\$ 15	\$ -	\$ 15	\$ 115	15.0%
Actual Cost < Target Cost	\$ 90	\$ 15	\$ 5	\$ 20	\$ 110	22.2%
Target Cost > Actual Cost > Ceiling Price	\$ 110	\$ 15	\$ (5)	\$ 10	\$ 120	9.1%
Actual Cost > Ceiling Price	\$ 130	\$ 15	\$ (15)	\$ (10)	\$ 120	-7.7%

Figure 5. Four Cost and Profit Scenarios under a Hypothetical FPIF Contract

The ratio of realized profit relative to actual cost is graphically represented in Figure 6.

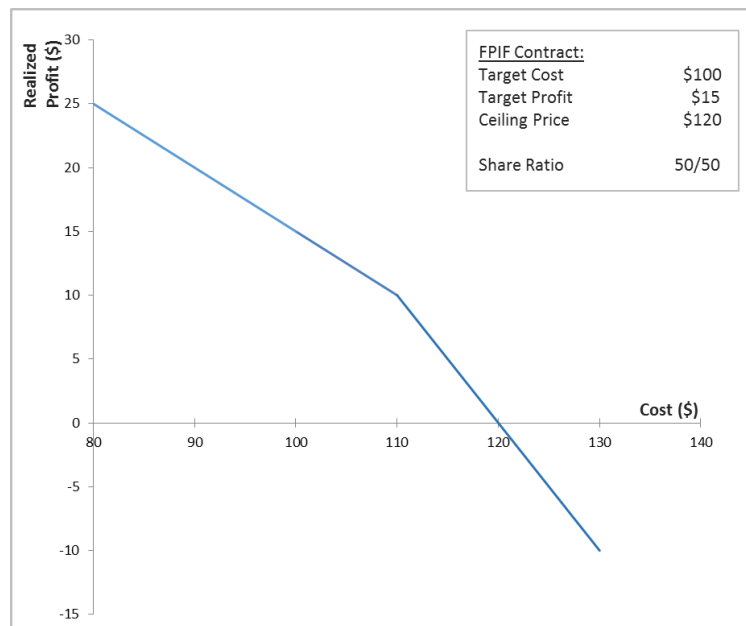


Figure 6. Linear Representation of Realized Profit Relative to Actual Cost under a Hypothetical FPIF Contract

3. Advantages and Disadvantages of FPIF Type Contracts

Just as with FFP contracts, there are also a number of advantages and disadvantages associated with the use of FPIF contracts. Contracting professionals must weigh these aspects carefully when deciding if FPIF is appropriate.

a. Advantages of FPIF Type Contracts

This section discusses several advantages associated with FPIF contracts. The primary advantage is the sharing of risk and rewards between the government and contractor to incentivize effective contract performance. FPIF contracts also require less precision about contract costs at the time of award than FFP contracts require. In addition, FPIF contracts offer greater flexibility than FFP contracts.

(1) Sharing of Risk and Rewards

A well-structured FPIF arrangement allows the contractor the opportunity to control cost and performance to maximize its profit margin, and for the government to obtain benefits as well. The use of FPIF contracts allows for the risk of contract performance to be shared more equitably between the government and the contractor than does an FFP-type contract. Under an FFP contract, the contractor bears the entire risk of cost overruns. Under an FPIF contract, the interplay of the elements of target cost, ceiling price, and share ratio allow for the parties to share any cost overruns above the target cost up to the ceiling price. Likewise, when the cost of performance is lower than the target cost, the share ratio allows the government to benefit from a share of the cost savings.

(2) Requires Less Precision about Contract Cost of Performance at the Outset

The applications of FPIF contracts as described previously are inherently conditions in which some cost uncertainty exists. We are less able to accurately estimate the final cost and price of contract performance such that the use of an FFP contract is not appropriate. Although we should feel a reasonable degree of confidence in estimating the target cost and ceiling price of an FPIF contract, the target cost represents just a single point in the range of possible actual costs (OUSD [AT&L], 2016). The establishment of

the ceiling price and the share ratio account for the potential variations and risk in the contractor's actual cost of performance.

(3) Flexibility

An FPIF-type contract can give the government and the contractor some flexibility that is lacking under an FFP contract. By its very nature, an FPIF contract is meant to give the contractor the flexibility to manage and make tradeoffs between cost and performance, and help both parties to control cost growth and mitigate schedule delays (OUSD [AT&L], 2016). The contractor may be more flexible and amenable to contract changes when it is firmly in a cost underrun situation. It is also possible that the parties may be able to negotiate small changes to the contract's requirements or delivery schedule by negotiating a change to the incentive share ratio without the need to renegotiate the FPIF target cost and ceiling price.

b. Disadvantages of FPIF Contracts

This section identifies several disadvantages associated with FPIF contracts. FPIF contracts are more complex than FFP contracts to price, analyze, and negotiate. FPIF contracts require the contractor to deploy more complicated accounting and earned value management systems to track actual contract costs; these systems lead to increased efforts by the Government to administer FPIF type contracts. However, the Government workforce lacks experience with such administration.

(1) Complexity

FPIF contracts are more complex than FFP contracts. FPIF contracts require the parties to develop and negotiate more cost parameters than if they were to employ an FFP contract. Developing target cost, ceiling price, and the government/ contractor share ratios requires more intensive cost analysis. The ability to use multiple share ratios (i.e., a different share ratio for cost underruns and another for cost overruns) and the potential for using non-cost incentives to motivate objective performance or schedule parameters further adds to the complexity of FPIF contracts. The contractor's need to balance cost, schedule, and performance, especially in the presence of multiple incentives, also adds complexity during contract execution.

(2) Contractor System Requirements

FPIF contracts require the contractor to establish and maintain more systems than would be required under an FFP contract. FAR (2016) § 16.403-1(c)(1) limits the use of FPIF by requiring the contractor to have an accounting system that is adequate for providing data in support of negotiating revisions to the incentive price as well as the final contract cost and price. As previously discussed, administering an accounting system that is CAS compliant and meets all the DFARS criteria for adequacy is expensive and complex for the contractor.

In addition, the use of an Earned Value Management System (EVMS) is required for FPIF contracts over \$20 million, with a formally validated and accepted EVMS required for FPIF contracts over \$50 million (DOD, 2015). The Defense Acquisition Guidebook defines Earned Value Management as “a management approach...to ensure the total integration of cost, schedule, and work scope aspects of the program.” (DOD, 2013, para. 11.3.1). Like accounting systems, EVMS are costly and difficult to implement. A joint Coopers & Lybrand/TASC, Inc. (C&L/TASC) study indicated that EVMS ranked third among the top ten cost drivers for contractors in activity-based costing systems, adding a nearly one percent cost premium to a contract. The C&L/TASC study also found that contractors felt EVMS requirements were too expensive, repetitive, and voluminous, as well as using program management resources better spent focusing on contract performance (1994).

(3) Higher Degree of Government Administration

FPIF contracts place additional administrative burden on the government as well as the contractor. The government has the responsibility to determine the adequacy of the contractor’s required accounting system, through DCAA audits or other measures the contracting officer deems acceptable for determining contractor responsibility.

The requirement for EVMS reporting also creates a requirement for government administration of the reporting. Receiving EVMS data allows the government to monitor contractor performance at regular intervals, but evaluating this voluminous data is a time-consuming and complex endeavor. The government must employ personnel to review

and analyze the EVMS reporting and make determinations about how the contractor is performing relative to cost and schedule budgets for the contract. The results of EVMS data evaluation may require further government administration if changes to the contract's requirements or schedule are indicated.

(4) Lack of Government Workforce Experience

Our research indicates that FPIF-type contracts are not widely utilized at many commands. When we attempted to expand our research beyond PEO Missiles and Space to PEO Ground Combat Systems (GCS) and PEO Combat Support and Combat Service Support (CS&CSS), we found very few instances of FPIF contract use in acquisitions for those two PEOs. A survey seeking interview sources within ACC-Warren revealed that only three individuals out of the approximately sixty contract price/cost analysts, or five percent, had experience negotiating FPIF contracts. This indicates that the government workforce has a marked lack of experience in crafting, negotiating, and administering FPIF contracts.

D. BETTER BUYING POWER AND FPIF CONTRACTS

In 2010, the DOD had a budget of approximately \$700 billion. Of that total, approximately \$400 billion was spent on contracts for major weapon systems, supplies, fuel, services, and transportation (Carter, 2010a). As budgets have become more fiscally constrained in the last decade, it has become imperative for the Department's acquisition community's contracting activities to become more efficient.

On June 28, 2010, the Defense acquisition world got its first official hint of Better Buying Power (BBP). Ashton Carter, then-USD (AT&L), issued a memorandum titled "Better Buying Power: Mandate for Restoring Affordability and Productivity in Defense Spending," which was aimed at improving the way the DOD does business and delivering better value for taxpayer dollars. BBP's objective was to conduct DOD acquisitions more efficiently, with the ultimate goal of obtaining "two to three percent net annual growth in warfighting capabilities without incurring a commensurate budget increase by identifying and eliminating unproductive or low-value-added overhead; in effect, doing more without more" (Carter, 2010a, p. 2).

1. BBP 1.0

On September 14, 2010, in a memo titled “Guidance for Obtaining Greater Efficiency in Productivity in Defense Spending,” Carter further elaborated on how BBP would help improve effectiveness and efficiency within DOD acquisition. BBP introduced five major areas:

1. Target affordability and control cost growth;
2. Incentivize productivity and innovation in industry;
3. Promote real competition;
4. Improve tradecraft in services acquisition; and
5. Reduce non-productive process and bureaucracy (Carter, 2010b).

Of the five focus areas, the second one, “*Incentivize productivity and innovation in industry*,” had as one of its principal actions to increase the use of FPIF-type contracts, where appropriate. In general, FPIF is viewed as being most applicable in early production and in sole-source production where the government can reward year-over-year cost improvements (Carter, 2010b).

2. BBP 2.0

In November 2012, Frank Kendall, Carter’s successor as USD (AT&L), issued a memorandum to the Defense acquisition workforce indicating that the original BBP mandate was not static, one-time guidance and would continue to evolve and incorporate new ideas and lessons learned. As a result, BBP (now referred to as BBP 1.0) was succeeded by Better Buying Power 2.0 (BBP 2.0), which reinforced and modified BBP 1.0 guidance, as well as introducing new initiatives (Kendall, 2012). Whereas BBP 1.0 had focused on best practices in acquisition, BBP 2.0 interlaced those best practices with an emphasis on applying professional technical judgment.

The April 24, 2013, BBP 2.0 implementation directive memorandum listed seven key areas of focus to continue achieving greater efficiency and productivity in DOD contracting, including:

1. Achieve affordable programs;

2. Control costs throughout the product life cycle;
3. Incentivize productivity and innovation in industry and government;
4. Eliminate unproductive processes and bureaucracy;
5. Promote effective competition;
6. Improve tradecraft in acquisition of services;
7. Improve the professionalism of the total acquisition workforce (Kendall, 2013a).

BBP 2.0 outlined three initiatives to support the focus area “Incentivize productivity and innovation in industry and Government” that are related to the use of FPIF contracts. First, the initiative “*Align profitability more tightly with Department goals*” addresses the importance of profit as the prime motivator of defense contractors and stresses that profit is essential to maintaining a strong defense industrial base. This initiative puts forth the idea that DOD profit policy and acquisition strategies should effectively incentivize defense industry contractors to develop and deliver cost-effective and align profitability with contract performance (Kendall, 2013a).

The other two initiatives related to this focus area, “*Employ appropriate contract types*” and “*Increase use of Fixed Price Incentive contracts in Low Rate Initial Production,*” are closely linked and provide clarity to the principal actions of BBP 1.0. The “*Employ appropriate contract types*” initiative urges DOD contracting professionals to consider the entire spectrum of contract types and tailor the contract type to the product or service being procured by considering, among other factors, the appropriate allocation of risk between the government and the contractor. This initiative also clarifies that BBP 1.0 was not encouraging FPIF contract types to the exclusion of other types (Kendall, 2013a).

The initiative “*Increase use of Fixed Price Incentive contracts in Low Rate Initial Production*” further clarifies that BBP 1.0’s focus on FPIF contracts was primarily intended to discourage the use of FFP contracts too early in a program’s life cycle (Kendall, 2013a). During TD and EMD, requirements are certain to change and evolve, making it difficult or impossible for the government or the contractor to accurately

estimate manufacturing costs. However, employing an FPIF contract during a program's transition from development to production may be a method for mitigating manufacturing cost risk.

3. BBP 3.0

Two years after the inception of BBP 2.0, Kendall released the "Implementation Directive for Better Buying Power 3.0—Achieving Dominant Capabilities through Technical Excellence and Innovation." BBP 3.0 placed a stronger emphasis than did its predecessors on innovation, quality products, and technological military superiority; however, it was characterized as "more continuity than change" (Kendall, 2015a, p. 1). Like BBP 2.0, BBP 3.0 represented incremental evolution from its predecessor rather than any radical change. With respect to FPIF contracts, this continuous improvement is evident in retaining the core initiative "Incentivize productivity in industry and Government."

This core initiative continues to emphasize the guidance to "*Align profitability more tightly with Department goals*" by declaring that profit should be reasonable and commensurate with contract performance; that is, higher profit levels should be tied to better contract performance. Likewise, poorer contract performance should result in lower profit levels (Kendall, 2015a).

BBP 3.0 combines the two BBP 2.0 initiatives "*Employ appropriate contract types*" and "*Increase use of Fixed Price Incentive contracts in Low Rate Initial Production*" into a single piece of guidance: "*Employ appropriate contract types, but increase the use of incentive type contracts.*" Citing the *2014 Annual Report on the Performance of the Defense Acquisition System*, the BBP 3.0 Implementation Directive states that earlier BBP focus on incentive-type contracts has been effective in correlating contract incentives with improved cost and schedule performance (2015a). As a result, BBP 3.0 reinforces the DOD's preference for employing incentive type contracts, including FPIF contracts, when appropriate.

Determining when FPIF contracts are appropriate is a matter of professional judgement and must take into consideration myriad procurement aspects. Kendall has stated that “for low-risk programs in the Engineering and Manufacturing Development phase and for most programs in production, where products and processes are well understood, FPIF contracts can be very effective in incentivizing cost control and productivity growth” (Kendall, 2011, p. 3). It is worth noting that Kendall states it is not the aim of BBP or the FPIF contract type to reduce contractor profits to improve DOD efficiency and program affordability. On the contrary, DOD is willing to pay increased profit if the contractor is able to reduce the overall program cost and deliver better performance (Kendall, 2011). The BBP goal of increasing the use of FPIF contracts is to use contractors’ profit motive to incentivize better contractor performance. This results from allowing contractors to recognize increased profit margins by sharing in cost underruns that may result from more efficient and effective contract performance.

THIS PAGE INTENTIONALLY LEFT BLANK

III. DATA AND ANALYSIS

A. INTRODUCTION

In an attempt to assess the real-world impacts of transitioning from FFP to FPIF, the researchers conducted interviews of programs making this change. We reached out to numerous programs in several Program Executive Offices responsible for the Army's major weapon systems, but were only able to establish connections with programs within the Program Executive Office, Missiles and Space organization. A total of four interviews were conducted and a summary from each interview is attached as part of Appendix C. A list of the interview questions can be found in Appendix B. All four programs are ACAT IC Major Defense Acquisition Programs (MDAPs) conducting follow-on production procurements in the Operations and Sustainment phase of their life cycles. An MDAP's ACAT level can either be designated by the Defense Acquisition Executive or determined by its estimated cost for all planned program increments (DOD, 2015). DOD Instruction 5000.02 states that an ACAT IC is an MDAP whose estimated cost in FY14 constant dollars for all planned increments is expected to exceed \$480 million in research, development, test, and evaluation type funds, or \$2.79 billion in procurement type funds. It further states that an ACAT IC's milestone decision authority is a "DOD component head or, if delegated, the DOD component acquisition executive" (DOD, 2015, p. 44).

For the purposes of this research, and to eliminate any concerns relative to competition sensitive information, we have protected the anonymity of the programs and their prime contractors. No data or observations are directly attributed to any individual program. Programs and contractors are identified only by generic designators (e.g., Program A, Contractor 1) in order to avoid disclosure of contractors' proprietary or competition sensitive information.

B. THE PROGRAMS

1. Program A

This program entered Full Rate Production approximately 30 years ago. Their contracts serve primarily as a mechanism for procuring hardware, as well as some limited amount of services and Integrated Logistics Support, from *Contractor 1*. Due to fluctuating requirements, their contracting approach is for a single year procurement. Over the last several procurements, each year has been awarded as an Undefined Contract Action (UCA) due to time constraints.

2. Program B

This program entered Full Rate Production almost 50 years ago. Their contracts serve as a mechanism for procuring hardware from *Contractor 2*. This particular program has a multiyear contract, covering five years (FY12-16). Each year of this contract has been awarded as an UCA due to time constraints. This means that deliveries for earlier years have already completed prior to definitization.

3. Program C

This program entered Full Rate Production just over 20 years ago. Their contracts serve as a mechanism for procuring hardware from *Contractor 1*. This particular program has a three year contract (FY13-15).

4. Program D

This program entered Full Rate Production just over 30 years ago. Their contracts serve as a mechanism for procuring hardware from *Contractor 1*. This particular program has a three year production contract (FY15-17) for hardware only. A drastic change in user requirements resulted in the first year being awarded as a UCA.

C. DISCUSSION OF DATA COLLECTED

The collection and interpretation of data is a very important step in the research process. Otherwise, all inferences about this topic would be speculation on the part of the researchers. This section discusses the data the researchers collected through interviews with program management personnel and contracting professionals.

1. Program Background

We interviewed individuals from a total of four programs that have made the transition from FFP to FPIF. Within those four programs, there are two major defense contractors represented. Across these programs, the contracts primarily focused on the procurement of hardware (with one program purchasing a limited amount of services, relative to the hardware being procured). All four programs are very mature and have been in the Operations and Sustainment phase of the life cycle for quite some time. Of the four programs, only one was receiving Cost and Software Data Reporting (CSDR) Form 1921 data at the time of transition to FPIF. CSDR Form 1921, titled “Cost Data Summary Report,” is used to report and collect contractors’ actual incurred program costs and other related business data (DOD, 2013). Among other things, program managers can use CSDR data to estimate the costs of future production increments and inform decisions about which contract type is most appropriate. Figure 7 identifies some of the basic attributes of the four programs we studied.

Program	Contractor	Products Procured		Life Cycle Phase	CSDR 1921 Data	Previous Contract Type	Final Contract Type
		Hardware	Services				
A	1	X	X	O&S	X	FFP	FPIF
B	2	X		O&S		FFP	FPIF
C	1	X		O&S	X	FFP	FFP
D	1	X		O&S		FFP	FPIF

Figure 7. Attributes of Studied Programs

2. The Impacts of the Transition

The overall intent of this research is to determine the impacts of transitioning from FFP to FPIF. Therefore, the interviews with each program focused on the collection of data to support this topic. As mentioned before, the interview questions can be found in Appendix B, and a detailed summary of each interview can be found in Appendix C. For the purposes of discussion, that data will be discussed in the following sections for each program. Table 1 shows a top level summary of how these impacts fall into the categories of short, mid, and long term.

Table 1. Summary of Interview Findings of Program Impacts Resulting from the Transition from FFP to FPIF.

Impacts of Transitioning from FFP to FPIF			
Program	Short Term	Mid Term	Long Term
A	<ul style="list-style-type: none"> • 12 month schedule slip in contract award • No previous knowledge of FPIF contract administration • EVM now required 	<ul style="list-style-type: none"> • Seeing more cost data than historically • Early indications show a decrease in profit 	<ul style="list-style-type: none"> • Not yet applicable
B	<ul style="list-style-type: none"> • EVM now required • Delay in negotiations 	<ul style="list-style-type: none"> • Not yet applicable 	<ul style="list-style-type: none"> • Not yet applicable
C	<ul style="list-style-type: none"> • Not yet applicable 	<ul style="list-style-type: none"> • Not yet applicable 	<ul style="list-style-type: none"> • Not yet applicable
D	<ul style="list-style-type: none"> • Delays to negotiations • EVM now required • No previous knowledge of FPIF contract administration 	<ul style="list-style-type: none"> • Not yet applicable 	<ul style="list-style-type: none"> • Not yet applicable

a. Program A

For this program, the transition from FFP to FPIF occurred in 2015. They awarded their FY14 procurement in December 2014 as an FFP UCA. During their peer review with the Office of the Secretary of Defense (OSD) Defense Procurement and Acquisition Policy (DPAP), they were directed by Mr. Assad, Director of Defense Pricing, to change contract type to FPIF. This direction came when their CSDR 1921 data

showed a previously realized profit of approximately 30% at both the prime contractor and subcontractor levels. Once Contractor 1 was informed of the change, they notified the government that they would have to revise their proposal, adding six months to the delays in procurement lead time. After sustaining a 12 month delay, this program successfully definitized their FY14 procurement in the first quarter of FY16 as an FPIF contract. Currently, both their FY15 and FY16 procurements have been awarded as UCAs. The government is working to definitize these contracts as FPIF contracts.

(1) What are the Positive Aspects of This Transition?

- Per the Contracting Officer, they are seeing more cost data than ever before.
- According to interviewees, OSD analyses indicated the program's previous 30% realized profit has decreased to an actual profit rate of approximately 20%. This analysis does not include data for the complete contract effort. The final profit percentage may still increase or decrease.

(2) What are the Negative Aspects of This Transition?

- Although the contractor stated they had never had a cost overrun, just six days after contract definitization, the contractor notified the government of a cost overrun.
- Because the contract was previously FFP, the contractor had not been required to submit Earned Value Management (EVM) data. As an FPIF contract, this was a new requirement, so several things came in to play. First, the cost for Contractor 1 to submit this data was approximately \$500K per year. The government would need to have at least two people to review and analyze this data, which they did not have. Luckily, after 12 months, Program A was able to obtain a Class Waiver, thus eliminating this requirement.
- To date, all of the work for this contract has not been completed; therefore, the incentive determinations have not been made. However, for an FY14 funded requirement, procurement funds will expire on 30 September 2016. If the contractor has not completed all of their work and submitted necessary data for analysis, this funding could expire for obligation.
- Contractor 1 presented significant resistance to this transition, causing a delay in definitization. However, as stated, this contract was awarded as FPIF.

(3) What are the Anticipated Benefits of This Transition?

- Program A is hoping for a decrease in the profit percentage. Currently, the contractor's cost data shows they are tracking toward a decrease of approximately 10%. However, this could change as the contractor still has not completed all of the work.

b. Program B

For this program, the transition from FFP to FPIF occurred in 2016. At the time of transition to FPIF, all five years of the multiyear contract had been awarded under one large (over \$1 billion) UCA. Each year, the UCA was amended to add additional quantities for that year's procurement requirement. During their OSD DPAP Peer Review, they were directed by Mr. Assad to change contract type to FPIF. This direction was given due to the lack of CSDR 1921 data that could be used to verify that the proposal costs were reasonable. This direction recently occurred and Program B is currently waiting on the contractor to submit a pricing update to their proposal. Once the pricing update is submitted, the government will begin negotiations with Contractor 2. Given that Contractor 2 has expressed disagreement with the FPIF approach, since a significant amount of work has been completed and all the contract deliverables were awarded under an FFP UCA, it is unknown at this time what further impacts will occur relative to the award timeline.

(1) What are the Positive Aspects of This Transition?

- At this time, Program B has been unable to realize any benefits of this transition.

(2) What are the Negative Aspects of This Transition?

- The beginning of negotiations to definitize the UCA were delayed in order to wait on the contractor to submit a pricing update.
- Having previously been FFP, Earned Value Management (EVM) data had not been required. As an FPIF contract, this was a new requirement. At this time, this program does not have personnel with the expertise of evaluating and managing this data. It is likely that they will proceed with requesting a waiver for this requirement.
- Program B does not have any experience in managing FPIF type contracts.
- This multi-year contract has been awarded in its entirety as an FFP UCA. A good portion of the deliveries associated with this award have already

been delivered to Program B. Therefore, it is not clear how it will benefit the government to award as FPIF.

- There is no way for Program B to realize savings on expired money as any funding removed is already expired for the purposes of obligation. Furthermore, this funding cannot be used for other purposes or programs.

(3) What are the Anticipated Benefits of This Transition?

- Program B is hoping for a decrease in the profit percentage.

c. Program C

For this program, there has been no transition. During their most recent contract award and peer review, concern was expressed early on by OSD that there would be a potential recommendation/direction to transition from FFP to FPIF. Program C was able to defend their cost analyses with supporting information from the contractor via their CSDR 1921 data. This proved to be very influential in the review with OSD. This program had a realized profit percentage of approximately 15%. Since there is no transition, there are no pros and cons to be discussed.

d. Program D

For this program, the direction to make this transition from FFP to FPIF occurred in 2016. This decision was made at a local level, prior to going to the OSD DPAP Peer Review. It was the determination of the Director of Army Contracting Command, Redstone Arsenal to make this transition. Shortly following this decision, this path forward was briefed at the OSD DPAP Peer Review and given the support of Mr. Shay Assad, Director of Defense Pricing. This decision was made based upon the following data points. First, this program was not yet receiving CSDR 1921 cost data. Second, the pricing analysis showed suppliers were realizing excessively high profit percentages. Finally, the pricing analysis showed the prime contract had realized a 30% profit percentage previously. However, it was the contention of Program D that this realized profit was skewed due to some non-recurring efforts performed under this contract type. Additionally, although they did not have CSDR 1921 data at the time of decision, the data is a deliverable of the current contract. Currently, negotiations are underway for this program, but Contractor 1 has yet to

provide a counteroffer in an FPIF format and still contends it should be FFP. It is not yet known how this will be resolved between the two parties.

(1) What are the Positive Aspects of This Transition?

- At this time, Program D has been unable to realize any benefits of this transition.

(2) What are the Negative Aspects of This Transition?

- The beginning of negotiations were delayed in order to wait on the government to establish an FPIF offer.
- Because the contract was previously FFP, the contractor had not been required to submit Earned Value Management (EVM) data. As an FPIF contract, this was a new requirement. At this time, this program does not have personnel with the expertise of evaluating and managing this data. It is likely that they will proceed with requesting a waiver for this requirement.
- Program D does not have any experience in managing FPIF type contracts.
- Currently, it is the perception of Program D that the ability to realize benefits to the warfighter due to any contract underruns will be impossible. Currently, this contract is a three year contract and the program receives procurement funding. For hypothetical purposes, Figure 8 captures the concerns of utilizing funding received as a result of contract underruns.

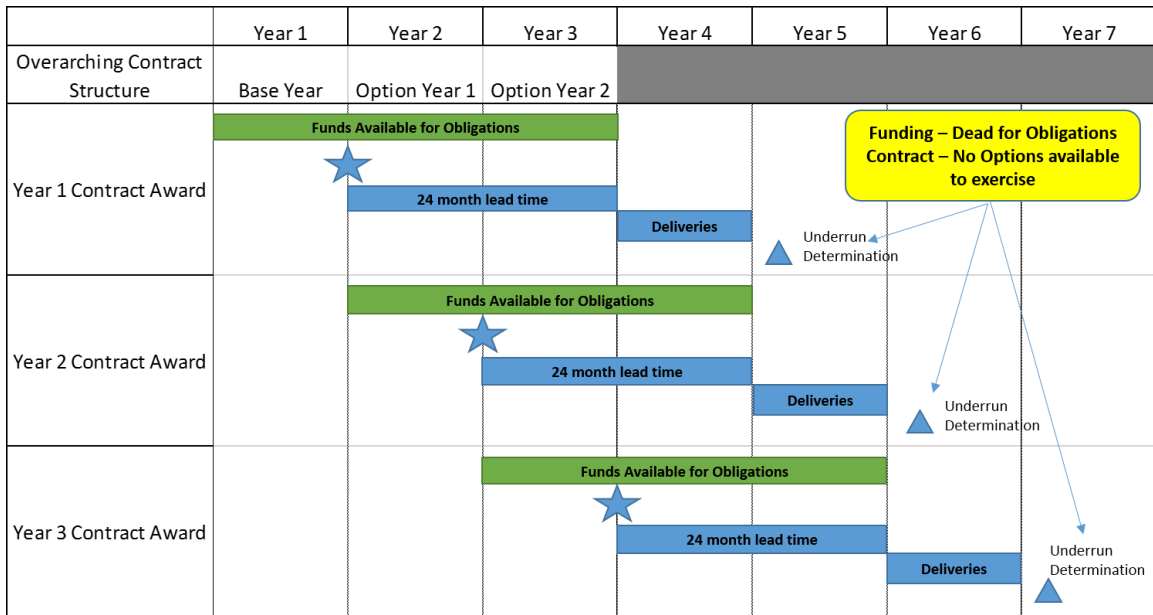


Figure 8. Hypothetical Funding Scenario for Program D.

(3) What are the Anticipated Benefits of This Transition?

- Program D is hoping for a decrease in the profit percentage.

D. DATA ANALYSIS

Based upon the data collected by the researchers, it is our overall determination that more data is needed. Within three PEOs for major weapon systems for the Army, we were able to identify only a handful of programs that have transitioned from FFP to FPIF. We interviewed personnel from all applicable programs that were willing to participate. Therefore, we have based our analyses on that data that has been made available. However, we feel it would be best to study a larger sample size. A larger sample would provide more data points and permit further analysis.

1. Overview of the Transition from FFP to FPIF

All four of the programs we studied are major weapon systems within PEO Missiles and Space that contemplated a possible change from FFP to FPIF for follow-on production increments. All of these programs are ACAT IC MDAPs that have been in production for many years and have expended multiple billions of dollars over their life

cycles. All of these programs had previously utilized only FFP for production of hardware; none had previously utilized FPIF contracts during production. For the three programs that did determine that a transition to FPIF was appropriate, these transitions have occurred after the 2010 introduction of the Better Buying Power initiatives.

2. Impetus for the Transition from FFP to FPIF

With the push to “do more without more,” it seems that OSD is putting a great deal of focus and pressure on programs where contractors have realized higher profit percentages than were negotiated on previous FFP production increments. In the case of the four programs interviewed, the three that were directed to FPIF from FFP were dealing with high profit percentages. Two of the programs were directed by Mr. Assad to use FPIF, while the third program’s contract type determination was made by the local Army Contracting Command director. Additionally, within the four programs, Contractor 1 is the prime contractor for three of these. Does that mean that Contractor 1 is a “problem child,” working to gain as much profit from government contracts as possible? We do not know the answer to this with the data that we collected, but it does stand out as a possibility.

3. Challenges Resulting from the Transition to FPIF

All three of the programs that have transitioned to FPIF contracts have encountered several challenges resulting from the switch from FFP to FPIF. First, the decision to change contract type has resulted in lengthy delays in negotiations for all three programs. Delays were particularly problematic in instances where the requirement had been awarded as a UCA and the contractors had previously expected to negotiate FFP contracts. The mid-procurement shifts in contract type were met with vehement resistance from the contractors, leading to many months of delay in providing negotiation offers, which further resulted in delays in contract definitization.

Second, the requirement to obtain EVM data has been complicated for programs that have transitioned to FPIF. This is a new requirement, because while EVM data is required for FPIF contracts, it had not been required under the previous FFP increments.

For one of the programs, it was estimated that the contractor's cost to submit this data was approximately \$500,000. Furthermore, the PEO estimated that each program would need at least two people to review and analyze this data; however, none of the three programs currently employ personnel with the expertise of evaluating and managing EVM data. While Program A was eventually able to obtain a waiver of the requirement, it took an entire year to gain this approval. The other two transitioned programs have not yet obtained waivers, but it is likely that they will proceed with requesting that OSD waive the EVM requirement.

Finally, the program offices and the supporting contracting activity both lack experience with FPIF contracts. None of the three program offices affected by an FPIF transition have any previous knowledge of FPIF contract administration.

4. Benefits Resulting from the Transition to FPIF

Of the programs that have transitioned to FPIF, all of their transitions have occurred within the last two fiscal years. This is so recent that none of them have had the opportunity to see completed performance of an FPIF contract. Therefore, it is unknown what the contractors' final actual costs and realized profit rates will be in relation to the target costs, target profits, and ceiling prices established at the time of contract award. However, the one program that did have an estimated profit rate found that the contractor is currently experiencing a profit rate of approximately 20%, which is a substantial decrease from the 30% actual profit rate the contractor realized on the previous FFP production increment. Although this estimate does not include data for the complete contract effort and the final profit percentage may still increase or decrease, early indications are that the government will realize a cost benefit by using FPIF on this program.

The three programs that have transitioned to FPIF also receive more actual data than they received historically from contractors, as the contractor is required to provide actual data on the cost of contract performance at regular intervals. This cost reporting provides the government with greater visibility into the cost of hardware and services it buys and helps inform programmatic decisions. With respect to EVM data, this reporting

can give the government early knowledge of cost and schedule variances. While one program we studied had obtained a waiver of the EVM requirement, the status of waivers on the other two programs is not final. Therefore, it is not currently known if these programs will obtain EVM data and its resulting benefits.

In general, because these programs have transitioned to FPIF so recently, and none have seen performance of an FPIF contract to completion, it is not possible to understand or predict the mid- or long-term benefits may be achieved in the future. It is worth noting that all of these programs are close to the end of their “life.” None of these programs has seen a milestone decisions in over 20 years. At this point in their life cycle, textbooks would say these programs should be awarded as FFP, not FPIF. As discussed in this chapter, none of these programs have seen any long-term impacts from transitioning to FPIF contracts. Only one of the programs has mid-term impacts. It does appear that the longer the program is in an FPIF environment, the more the program impacts start trending toward the positive aspects from the negative. However, given the late stage of their life cycles, will these programs be around long enough to ever get to that point?

IV. THE “WAR ON PROFIT”: A CORPORATE PERSPECTIVE

A. INTRODUCTION

The Better Buying Power initiatives have encouraged the DOD to “do more without more” (Carter, 2010a, p. 4), and one of the principal actions to accomplish that is to use more FPIF type contracts instead of cost type or FFP type. The government’s position is that by incentivizing the contractors, contractors will in turn control costs and be innovative to increase their profits. And because the government is willing to share in the cost overruns under an FPIF contract, the target cost should be less than the awarded price of an FFP contract. As part of the incentive, the government gets a share of any cost underruns, making BBP and the increased use of FPIF contracts a win for both sides—at least, according to the government. Industry has taken a different view of BBP and what they see as the government’s ongoing “war on profit.”

B. HISTORICAL AND POLITICAL CLIMATE

During the military buildup in the 1980s, the Persian Gulf war in the early 1990s, and the Iraq and Afghanistan wars from 2001 to 2011, contracts with the DOD were numerous and the profit plentiful. Profit rates from 8–15% could be found throughout this time, despite the push as early as the 1980s to reduce costs by moving from cost type contracts to more firm fixed price contracts and the “doing less with less” initiative during the 1990s (Gill, 2014, p. 11). The need for new and better equipment to support the war efforts took precedence over the need to reduce cost and profit (Gill, 2014). Now, as the war effort has drawn down, the political climate has again changed, and the Pentagon is again under pressure to reduce their budget and eliminate unaffordable programs (Erwin, 2013).

C. PROFIT AND THE DEFENSE INDUSTRY

It is easy to find examples of defense contractors egregiously overcharging the DOD for the goods and services it buys. Four hundred dollar hammers and \$600 toilet seats are the stuff of legends. More recently, DOD Inspector General audits have found that major contractors, such as Sikorsky, Boeing, and Bell Helicopter have charged

enormously excessive prices for spare parts; anywhere from 3 to 17 times above fair and reasonable prices from Bell Helicopter, all the way to a shocking 177,000 percent overcharge from Boeing (Smithberger, 2015). But do these headlines tell the whole story? Are they typical of defense contractors' profits or are they isolated incidents? This section examines the definition of profit and related DOD guidance and analyzes whether contractors in the defense industry are actually reaping windfall profit margins.

1. Definition and Guidance

Merriam-Webster.com defines profit as “money that is made in a business, through investing, etc., after all the costs and expenses are paid: a financial gain” (Profit, n.d.). Ultimately, profit is the essential reason that businesses exist: to make money and provide a return on investment to their shareholders or owners. If a business does not earn a profit on its revenues, it will eventually die.

The dictionary definition of profit differs from the FAR definition of profit or fee. Although profit and fee are often casually used interchangeably, profit specifically indicates a contractor's return on fixed-price type contracts and fee indicates the return on cost-type contracts. Per FAR (2016) § 15.404-4, profit or fee are not necessarily indicative of net income received by the contractor.

Rather, they represent that element of the potential total remuneration that contractors may receive for contract performance over and above allowable costs. This potential remuneration element and the Government's estimate of allowable costs to be incurred in contract performance together equal the Government's total prenegotiation objective. Just as actual costs may vary from estimated costs, the contractor's actual realized profit or fee may vary from negotiated profit or fee, because of such factors as efficiency of performance, incurrence of costs the Government does not recognize as allowable, and the contract type.

There are a number of legitimate business costs that the contractor incurs but that FAR (2016) § 31 excludes from contract costs as being unallowable, such as bad debts, advertising, excess executive compensation, and interest on financing. The contractor's

negotiated profit or fee must cover those costs too, and therefore, does not represent pure return to the contractor.

What does the FAR say about limitations on profit or fee? With regard to fee, FAR (2016) § 15.404-4(c)(4)(i) limits fee on most cost contracts to 10% (with an exception for R&D or experimental cost contracts, which are limited to 15%). However, the FAR makes no such prescription regarding profit for fixed price contracts. In the researchers' experience, we have rarely seen FFP or FPIF contracts, especially for major weapon systems, negotiated above 15%.

2. What Is Too Much Profit?

In the absence of statutory or regulatory guidance, who defines how much profit is too much? In 2010, President Obama spoke about excessive profits in general, remarking, "I mean, I do think at a certain point you've made enough money" (Obama, 2010, para. 39). That attitude seems to have filtered down into Defense acquisition leadership. The Director of Defense Pricing has publicly commented that the DOD generally overpays for almost everything it buys and that he will be "relentless in pursuing getting the good deal for the taxpayers" (Mitchell, 2016). At a 2013 industry conference, General Wendy Masiello, then-Air Force Deputy Assistant Secretary for Contracting stated,

I need to understand the cost and the resulting profit. It's a little scary that we've never had that, we've never had that kind of insight. It can be a little threatening that they figured out how to make a lot more money and return on that investment than the government might have been reaping in that process (Erwin, 2013, para. 12).

Although Assad and other DOD acquisition leaders insist there is no war on profit, it is easy to see how comments like the preceding statements might lead the defense industry to conclude otherwise.

3. Analysis of Defense Industry Profits

While there are certainly arguments that defense contractors make too much money, we should ask the question: in relation to whom? In order to determine whether

the amount of profit earned by defense contractors is excessive, we studied the industry’s average operating margin compared to operating margins in other industries in the Standard and Poor’s (S&P) 500 Index. The S&P 500 Index “includes 500 leading companies and captures approximately 80% of available market capitalization,” and its index assets total approximately \$2.2 trillion (S&P 500, 2016). In 2014, the Defense Business Board (DBB) reported on average defense industry profit margins, concluding, “Compared to other markets, the Defense industry has the lowest returns” (p. 39). In Figure 9, the bold dark blue line represents the Renaissance Strategic Advisors Defense Index, which is comprised of 41 publicly-traded defense companies. Figure 9 clearly demonstrates that in nearly all of the 33 years covered by this graph, the Defense Index recognized lower operating margins than S&P indices for capital goods, pharmaceuticals and biotechnology, technical hardware, software and services, and utilities, and indeed, lower than the overall S&P 500 Index.



Figure 9. 1980-2013 Defense Index Profit Margins Compared to Various S&P Indices. Source: Chandler (2014).

Dr. Daniel Gouré, a vice president with the nonprofit public-policy research organization Lexington Institute, reported in 2012 that the average operating margin in the defense and aerospace industry was 10.3 percent, while that of all U.S. industry is 18.3 percent – a difference of 42 percent. However, even that 10.3 percent operating margin is a bit rosy. Since that profit margin includes both defense business and commercial business, and it is likely that the commercial portion earns higher margins, the margins attributable to defense contracts are even lower than the reported 10.3 percent. Furthermore, as Gouré reports and as evidenced in Figure 9, even the 10.3 percent margin is high by historical standards. Gouré found that until the wars in Iraq and Afghanistan caused a surge in the demand for defense weapon systems, the average profit rate for the defense and aerospace industry was approximately eight percent. With declining defense budgets and the threat of sequestration, Gouré opines that it would be logical to expect defense industry profits to return to historic average levels over the next few years (Gouré, 2012). The most recent results available, for 2015, indicate that operating margins for the U.S. defense and aerospace sector have not changed much in the past few years; the 2015 average operating margin for this sector was 11.6% (Captain, 2016).

Specific to the major weapon systems under the purview of PEO Missiles and Space, former Lockheed Martin senior vice president for strategy and business development Robert H. Trice studied profit margins for what he termed the “Big 7” defense and aerospace contractors. Trice defines the Big 7 as including Lockheed Martin, Boeing, Northrop Grumman, General Dynamics, Raytheon, L3 Communications, and Honeywell Corporation (2012). Trice’s study found that in 2009, the average profit margin of the Big 7 members was around seven percent, far below the top companies from other industries such as IBM (14%), Cisco (17%), Microsoft (28%), or Merck (47%). Trice further notes that none of the Big 7 companies are included in “Fortune Magazine’s annual ‘Top 20’ lists among its 500 largest companies when measured in terms of return on revenue, return on assets, percent increase in profits, or percent increase in revenue” (2012, p. 4). Trice concludes that the Big 7 contractors, all of which

are players in PEO Missiles and Space programs, fall “in the middle of the American industrial pack in terms of profitability” (Trice, 2012, p. 4).

D. DEFENSE CONTRACTORS’ PERSPECTIVE AND EFFECTS OF PROFIT POLICY

If the government wishes to influence defense contractors and use profit as a motivator to incentivize them to provide more, at a lower price, we must first understand the contractor’s perspective. Why is it that dozens of contractors show up for an industry day, but very few actually bid when the solicitation is published? Why do contractors compete to be part of a Multiple Award Task Order Contract, and then decline to compete for task orders over and over again? This section examines the defense industry’s reasons for contracting with the government. It also analyzes several consequences as a result of the industry’s perceived tightening of DOD profit policy.

1. Benefits Received from Contracting with the Government

There are myriad ways in which contractors benefit from entering into contracts with the government. The most obvious reason is profit. Contractors want government contracts to earn a return on their investment. Like companies in every industry, they have stockholders to satisfy. But there are many other, sometimes less quantifiable, things that make government contracts particularly attractive. Some of these attractions include dependable cash flow, reputation, and the potential for future business, including change orders.

a. Cash Flow

Reliable and regular cash flow is a top benefit of working on government contracts. The government is well known for paying its bills on time, and numerous contract financing methods exist, such as progress payments and performance-based payments, which ensure that the contractor receives a steady and reliable flow of cash during contract execution rather than having to wait for payment until performance is complete. This allows the contractor to order material, pay its subcontractors, and maintain its labor force, arguably one of its most valuable assets.

b. Reputation and Future Business

Maybe more important than profit, is the promise of follow-on contracts. For large acquisitions like a weapon system, taking a development contract for little or no profit, possibly even at a loss, is a smart move to gain access to technology and to earn the ability to bid on the follow-on production contract, where the earning potential lies. Furthermore, being well known as a reliable defense contractor can assist with earning follow-on contracts, as having favorable past performance ratings is often crucial to future contract awards.

c. Change Orders

The reason least talked about by the government is for the anticipated “change orders.” When the government has not defined its requirements well, contractors can be tempted to “buy in” or underbid to obtain the contract with the intention of earning profit on the change orders issued after award (Summers IV, 1995). Some companies openly advertise for project managers to assist them in discovering opportunities for such change orders. The controls company, Johnsons Controls, advertised a job opening for the position of Systems Technology Project Manager whose second principal duty was, “Evaluates the contractual scope of work and the impact of client issued bulletins, field directives and/or scheduling changes. ***Actively pursues additional work through change orders.*** Performs associated cost estimates, prepares proposals, negotiates final settlement price and customer acceptance” (Systems Technology Project Manager, n.d.). Figure 10 humorously illustrates how lucrative this can be for contractors. The figure depicts a tiny dinghy as the “original contract” beside a far larger watercraft, which represents the change orders.



Figure 10. The Yacht “Change Order” with its dinghy “Original Contract.”
Source: Buckshon (2009).

2. Resulting Effects of Profit Policy

As the government’s budget sequestration woes continue, it is difficult for companies to project government spending trends. Add to that the cancellation or severe curtailment of major projects and contractors are finding work with the government to be an increasingly risky proposition. Being unsure if the contract being bid will last for five years, or if it will be canceled after two, contractors have to weigh all the pros and cons of government contracts carefully. Add to this all the BBP reforms and industry feels it is being squeezed. More and more, the government is demanding insight into companies’ cost structures, bringing on cost estimators and creating a defense-wide pricing database to assist program managers and PCOs with their negotiations, using the contractor’s own cost data to negotiate lower prices and profit rates (Butler, 2011). As one CEO put it, “the initiative saves taxpayer money; but it also threatens to undermine industry’s ability to invest in new technologies by squeezing profits” (Blakey, 2011, para. 3). The profit policy resulting from the reforms may have unintended consequences which may be poorly understood by the DOD.

a. Barriers to Innovation

The DBB reported in July 2014 that the DOD's reliance on FAR Part 15 "Contracting by Negotiation" is a significant barrier to innovation. Profit earned on contracts allows the defense industry to invest in developing new and innovative technologies for future military applications. These innovations benefit not only the government but also serve many positive purposes for the contractor. The DBB found several key reasons that defense contractors seek to invest in innovative technologies, including:

- Innovation helps companies differentiate themselves from their competition, thereby conferring a competitive advantage
- New technologies lead to revenue growth and expansion of profit margin. This is likely to be even more true in cases where the contractor can apply that technology to products it offers to commercial customers
- Successful development and sales of innovative products leads to long-term profitability and sustainable market value (2014).

However, when contractors find their return on investment reduced through aggressive profit negotiations, they have fewer profit dollars to invest in innovation. As Pierre Chao from the Center for Strategic and International Studies' Defense Industrial Initiatives Group testified to the House of Representatives Armed Services Committee:

Pushing the limits of technology is expensive, is fraught with risk and setbacks, and can rarely be predicted with precision. Some of the cost overruns and delays are simply inherent to what we ask the acquisition system to undertake. As long as technological superiority is a key goal it will be impossible to reduce the overruns to zero. It does not mean we should tolerate poor performance and not try to improve the efficiency of the system; it simply says eliminating all cost overruns is incompatible with our strategic goals and potentially counterproductive (2013, p. 4).

Major defense contractors, including some, such as Northrop Grumman, who do business with PEO Missiles and Space, have been criticized by investors for reducing their spending on independent research and development (Erwin, 2015). However, it is not just contractors who are becoming reluctant to fund investment in new technologies. The DBB found that the profit margins earned by defense contractors are inadequate to attract investment capital from investors interested in innovation. These investors regard

companies in the defense sector more as a source of cash than as a source of innovative technologies. As a result, they often choose to invest in other sectors they view as more innovative with higher potential profits (2014).

b. Workforce

Profitable contractors attract a talented and highly educated workforce by paying salaries commensurate with employees' level of experience. When the DOD negotiates hard and pushes contractors to provide the lowest possible price, contractors are forced to reduce their investment in talent development; employment of experienced, but more expensive, personnel; and providing benefit packages that attract and keep the best personnel (Defense Business Board, 2014). Eventually, the contractor will not be able to maintain the personnel needed to execute the contract successfully, resulting in poor performance and poor product. The government should be concerned when major defense contractors are able to report strong returns, but are earning those returns by shedding 20 percent of their workforce over a five year period, like Lockheed Martin recently did (Thompson, 2013). The DBB determined that slimmer profit margins make it extremely difficult for defense contractors to retain highly-skilled employees in certain fields. Defense contractors must compete with Wall Street firms and Silicon Valley technology companies for the nation's brightest and best employees. These non-defense sector companies continue to lure top talent away from defense contractors with better salaries and benefits packages, as well as the promise of more interesting, challenging, and innovative duties (Defense Business Board, 2014).

Loss of talented and experienced personnel is potentially problematic for PEO Missiles and Space. In the *2013 Annual Industrial Capabilities Report to Congress*, the USD (AT&L)'s Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy states that missile systems are largely defense-unique solutions that require a specialized labor force for design, engineering, and production. Furthermore, it is difficult for contractors in this sector to attract and retain a workforce with the specialized industrial knowledge necessary to support these programs. The report states that fluctuations in missile demand, contraction of the defense budget, and

DOD profit policy have reduced the existing labor expertise in missile technologies. The report also finds that this is particularly a problem for design engineering for missile propulsion systems and tri-mode seeker technology, which are wholly defense-unique capabilities (2013).

c. Effect on Cost Efficiencies

Contractors must earn a return on their current investment in order to fund cost reduction measures and invest in efficiency initiatives. Cost reductions and production efficiencies on existing programs are essential to maintaining profitable programs. In a full-rate production environment, the contractor's ability to reduce recurring costs often depends upon sufficient profit to reinvest in new capital equipment, tooling, and infrastructure. Profit is also required to fund programs such as Lean Six Sigma, which identifies process improvements to eliminate the inefficient use of physical resources, time, and effort in order to improve production quality and processes. Although these types of investments are initially expensive, they reap many benefits over the future course of recurring production of weapon systems. When the DOD strives to reduce contract profit rates, the contractor's ability to invest in these cost-cutting measures is jeopardized, leaving them challenged to implement efficiency programs and reduce contract costs to the government. With regard to FPIF contracts, it is imperative that the contractor has the ability to identify and implement efficiency initiatives and reduce costs in order to achieve actual contract costs below the Target Cost and therefore earn a higher share of the resulting cost underrun, i.e., earn more profit.

d. Shrinking Industrial and Technology Base

The industrial base that supports the U.S. warfighter is a fundamental component of our country's national security. However, when other industries' profit margins are reaching 20% and more, while defense industry profit margins are at 12% or less, companies are forced to evaluate the business case for continuing in the defense sector. The fewer companies that are willing to compete for government contracts raises the risk of higher prices from the lack of competition and poorer quality from the lack of highly qualified suppliers (Anderson, 2013). Worse yet, it will not be the poorly performing

company with marginal skills that exits the defense industry. It will be the very successful companies with cutting edge technology and the brightest minds working for them. This loss could be a tremendous threat to the U.S. military's technological advantage (Blakey, 2011).

Supporting the industrial base is of particular concern for PEO Missiles and Space programs. According to the *2013 Annual Industrial Capabilities Report to Congress*, the industrial sector that produces munitions and missiles is primarily a defense unique sector. The report also identifies that within this sector, two prime contractors account for approximately 85 percent of the DOD's procurement funding for these types of products (2013). Having defense-unique capabilities concentrated into a small base of contractors who own the technical data rights to the missile systems is a risk to the DOD. If one or more of these key contractors were to decide to exit the defense industry, it could be a decade or more before the DOD could replace its missile capability with technology from different contractors, given the length of the Defense acquisition life cycle.

The introduction of BBP 3.0 in 2015 maintained many of its predecessors' efficiency and productivity issues, but provided a new focus with the theme of "*Achieving Dominant Capabilities through Technical Excellence and Innovation*" (Kendall, 2015a). BBP 3.0 acknowledges that the U.S.'s technological warfighting superiority is at risk from potential adversaries, and that the nation's military capability depends on the efforts of the defense industrial base and their ability to innovate and develop military technologies (Kendall, 2015a). It is conceivable that profit policy resulting from other parts of the mandate, including increasing the use of incentive-type contracts, could be counterproductive to the overall goal. Indeed, since BBP was first introduced in 2010, there has been little entrance of contractors in the defense industrial base at either the prime contractor or subcontractor level. Rather, industry observers see a trend away from defense business throughout all sectors of DOD (Gill, 2014). It is reasonable to conclude that if defense firms were realizing "excessive" profits, more companies would be entering the defense section than leaving, growing the defense industrial base rather than shrinking it.

E. SUMMARY

Mike O’Hanlon, a defense specialist at the Brookings Institution and a longtime Pentagon advisor, says the profit margin issue “is a big one where contractors and much of the DOD acquisition workforce part ways” (Mitchell, 2016, para. 33). Is the government waging war on contractor profit or just trying to get a “fair and reasonable” price for the U.S. taxpayer? The answer can only be the ubiquitous “it depends.” If you are the government and have been charged with “doing more without more,” you are only trying to save the taxpayer money and do the job you have been assigned. Profit is the one variable in the total cost equation that cannot be easily defined. The defense industry’s perception, on the other hand, is that they have been receiving “fair and reasonable” compensation during all the years they have been supplying the war effort. Now that the government is looking to reduce the DOD budget, that “fair and reasonable” rate is coming under attack. The attempt to “do more without more,” (Carter, 2010a) and the idea of determining what a program “should cost” (Kendall, 2015a) are perceived as the government’s way of saving taxpayer money by reducing both cost and profit, at the expense of contractors (Blakey, 2011). The profit rates desired by the government are often a lot lower than what contractors feel they need to finance their innovation and growth, while protecting them from the risk of the unknown.

On the surface, the FPIF contract appears to be a perfect compromise to get both parties part of what they want and need to be successful. FPIF allows the parties to share risk and provides opportunities for contractors to earn additional profit as a result of efficiencies, which in turn, helps fund future investment in infrastructure and innovation. USD (AT&L) Frank Kendall acknowledged that profit is “the most powerful tool” the DOD can use to motivate contractors to provide better performance. However, he also notes that overly aggressive or inappropriate use of profit as a means of driving better contract performance may result in serious damage to the industrial base upon which the military depends to provide products and services to support the warfighter. Kendall cautions the DOD to

think carefully about unintended consequences. Industry may look at the situation very differently than we do. We can assume industry will try to

maximize its profit—by whatever means we make available. We also can assume industry will examine all the available scenarios—including ones we have not intended. That means we need to anticipate industry’s behavior and make sure that we align industry objectives with the performance we intend. (2015b, p. 4)

V. CONCLUSIONS AND RECOMMENDATIONS

The DOD's use of FPIF-type contracts has been increasing as a result of the advent of the Better Buying Power initiatives in 2010. The department has provided guidance on when FPIF is appropriate to use instead of FFP for follow-on production contracts. This project reviewed that guidance as well as various regulations regarding contract type. We collected data from four major weapon systems programs in PEO Missiles and Space that have transitioned from FFP to FPIF contracts to examine the impacts of the change in contract type. We also studied the defense contractor industry's perspective on Better Buying Power and profit policy. This chapter presents the answers to the research questions posed in Chapter I. It also provides recommendations based on the researchers' study, including a recommendation for additional research.

A. CONCLUSIONS TO RESEARCH QUESTIONS

- (1) What are the impacts of transitioning defense acquisition programs from firm-fixed price (FFP) type contracts to fixed-price incentive (firm target) (FPIF) type contracts?

In order to assess the impacts when defense acquisition programs transition from FFP to FPIF contracts, we studied programs within PEO Missiles and Space that have made the transition by conducting personal interviews with subject matter experts within the PEO and the supporting contracting activity, including program management personnel and contracting officers. Although all of the programs we studied effected this change in contract type within the last two fiscal years and none have seen complete performance of an FPIF contract, we were able to assess some of the short-term impacts of the transition. The programs have experienced challenges and complications related to schedule delays, difficulties in obtaining earned value management data, inadequate workforce experience with incentive contracts, and funding uncertainties. The contractors supporting these programs have strongly disagreed with the government's decision to utilize the FPIF contract type for these programs, adding further burden by causing delays in negotiations and contract definitization. Although these programs transitioned from FFP to FPIF so recently that contract performance is not complete, the government is

receiving actual cost data reporting that indicates in one instance, the contractor is achieving cost efficiencies and that the government may realize a cost benefit by using FPIF on the current increment of the program.

- (2) What does existing guidance prescribe regarding circumstances when FPIF should be used in lieu of other contract types?

Contracting professionals must take into consideration many procurement aspects when determining when FPIF contracts are appropriate, including existing guidance and regulations. FAR 16.403 discusses the general application of FPIF contracts, and the DFARS and DFARS Procedures, Guidance and Information (PGI) associated with this FAR Subpart further clarify circumstances in which FPIF contracts should be used. In general, FPIF contracts are appropriate in circumstances where an FFP contract would not be suitable, and when the contractor's assumption of cost responsibility provides a positive incentive to control contract cost and performance through the opportunity for increased profit margins (FAR [2016] § 16.403). This means FPIF should generally not be used in lieu of cost-type contracts for programs in the TD phase or EMD phases of their acquisition life cycle, when many of the program efforts will be of an R&D nature and costs and requirements are uncertain. USD AT&L Frank Kendall advises that in a limited number of EMD phases, FPIF could be appropriate if an MDAP's requirements are stable and mature, technical risk is low, and the competing contractors are both experienced and financially capable of assuming risk (2013b).

DFARS (2016) § 216.403-1(b)(1) directs contracting officers to give particular consideration to using an FPIF contract when a program is moving from development to the production phase of its life cycle. Indeed, BBP 1.0 stated that FPIF is viewed as being most applicable during LRIP and in sole-source production where the government can reward year-over-year cost improvements (Carter, 2010b).

Although FFP is generally the best contract type during full-rate production, there may be times when FPIF is a more appropriate choice. DFARS PGI 216.403-1(1)(ii)(B) states that it is not in the best interest of the government to use FFP contracts in a production phase if costs are not stable, a circumstance further defined as potentially

occurring when costs for efforts under previous FFP production contracts have varied by more than four percent from the costs that were negotiated at contract award (2016).

- (3) Is current guidance appropriately applied when programs shift contract type from FFP to FPIF contract types?

The PEO Missiles and Space programs we studied that transitioned from FFP to FPIF are all in the Operations and Sustainment phase of their life cycle and have been producing hardware for many years. All of these programs were previously procuring this hardware under FFP contracts. During peer reviews at the ACC Director and OSD DPAP levels, these programs were directed to utilize FPIF instead of FFP for the current production increment. Although peer review officials seemed to focus on profit percentages they deemed excessive, it is important to note that a realized profit rate that is higher than what was negotiated indicates that the contractor experienced a cost underrun compared to the negotiated cost. As stated in the answer to the previous research question, DFARS PGI 216.403-1(1)(ii)(B) guidance indicates that FFP contracts are not appropriate during production if costs are not stable, such as when costs for efforts under previous FFP production contracts have varied by more than four percent from the costs that were negotiated at contract award (2016). Although we did not have access to the negotiated profit rates on the previous FFP production contracts, the researchers have generally not seen FFP contracts for major weapon systems with negotiated profit rates in excess of 15%. Actual realized profit rates of 19% or more would indicate that costs have varied by more than four percent from the negotiated costs. Contractors had realized profits above 19% on their previous FFP production contracts for all of the studied programs that were directed to use FPIF contracts. Therefore, we determine that current guidance was appropriately applied when these programs were directed to transition to FPIF contracts.

- (4) What benefits has the government realized as a result of the transition from FFP to FPIF contracts?

For the studied programs that switched to FPIF contracts, their transitions occurred so recently that none of them have had the opportunity to see completed performance of an FPIF contract. Therefore, it is unknown what actual benefits the

government will eventually realize as a result of the transition from FFP to FPIF contracts. For one program, early cost results indicate that the contractor is currently experiencing a profit rate of approximately 20%, which is a substantial decrease from the 30% actual profit rate the contractor realized on the previous FFP production increment. Although contract performance is not complete, this is a positive indicator that the contractor is controlling costs and performing efficiently, and that the government may realize a cost benefit by using FPIF on this increment of the program.

Under an FPIF contract, the contractor is required to provide actual data on the cost of contract performance at regular intervals. Therefore, the three programs that have transitioned to FPIF also receive more actual cost data than contractors previously provided to the program office. This cost reporting provides the government with greater visibility into the cost of hardware and services it buys and helps inform programmatic decisions. Actual cost data will also benefit the government to make appropriate contract type decisions for any future production increments.

Because these programs' transitions to FPIF were so recent that none have seen performance of an FPIF contract through to completion, the researchers were unable to study any long-term benefits that the government may realize in the future.

(5) What challenges or drawbacks result from the use of FPIF contracts?

All three of the studied programs that have transitioned from FFP to FPIF have encountered challenges resulting from the change. All three programs experienced lengthy delays in contract negotiations after they received direction to change contract type. In some instances, the requirement had been awarded initially as a UCA and the contractors were expecting to negotiate FFP contracts. The contractors strongly resisted these mid-procurement changes in contract type, resulting in many months of delay in providing proposal pricing updates and providing counteroffers, which further delayed the negotiation and definitization of those contracts.

Second, although the receipt and analysis of EVM data has the potential to benefit the government, the new requirement to obtain EVM data has been a drawback for the studied programs that have transitioned to FPIF. The contractors for these programs were

not previously required to submit EVM data because such data was not required for previous production increments, which were under FFP contracts. Furthermore, these contractors did not currently have systems capable of complying with the requirement, and implementing such a system may be expensive. One contractor estimated that its cost to submit EVM data would be approximately \$500,000 per year. Furthermore, the studied programs did not currently employ the necessary personnel with experience to review, analyze, and manage this data. One of the studied programs was eventually able to obtain approval of a waiver of the requirement after an entire year of effort and routing. The other two transitioned programs are also likely to request a waiver of the EVM requirement. Therefore, although the provision of EVM data is a theoretical benefit to the government, in reality, these programs experienced only negative consequences from the requirement.

In addition, just as the programs did not have personnel with EVM expertise, the program offices and the supporting contracting activity both lacked experience with negotiating, awarding, and managing FPIF contracts. None of the three program offices affected by an FPIF transition have any previous knowledge of FPIF contract administration. This lack of experience with the contract type adds further challenge and burden to the programs' implementation of FPIF contracts.

- (6) How do contractors view the DOD's increased focus on the use of incentive contracting?

We were unable to obtain first-hand data from contractors; however, our literature review and the statements from interviewees appear to indicate that the defense industry is far less enthusiastic than DOD about incentive contracting and the implementation of the Better Buying Power initiatives. It is unsurprising that contractors are generally unwilling to speak on the record about their perspectives of DOD profit policy. Other researchers have noted that contractors are generally reticent about publicly expressing their views regarding profitability of defense contracts because their companies' livelihoods are significantly dependent on receiving DOD contracts; thus, contractors are reluctant to make statements that appear to "bite the hand that feeds them" (Gill, 2014, p. 11).

Although we were unable to obtain data directly from defense contractors, our interviews with personnel supporting PEO Missiles and Space programs revealed that contractors reacted negatively to the transition to the FPIF contract type. In all instances we studied, contractors have verbalized significant disagreement with the decision to switch from FFP to FPIF. They have also tacitly expressed their objections to the change in contract type by delaying their responses to the government's requests for proposal pricing updates and counteroffers, causing many months of schedule delay.

In general, our analysis determined that although industry enjoys a number of benefits from government contracting, defense contractors are finding that doing business with the DOD is increasingly risky as a result of DOD profit policy. We determined that the defense industry realizes lower operating margins compared to industries in other sectors, and they perceive that DOD profit policy is an attack on their already middling profitability. Reduced profitability leaves contractors less able to invest in innovative technologies, high-caliber workforces, or cost efficiencies. These factors may lead them to focus less on investing in defense business in favor of more profitable commercial opportunities, and some contractors could leave the defense industry altogether, threatening the industrial base and the nation's military capability.

B. RECOMMENDATIONS

1. Continue to assess future production increments of acquisition programs to determine where FPIF is appropriate

Although it is too early to draw any final conclusions about the transition to FPIF for the programs we studied, we recommend that programs continue to assess future production increments to determine whether changing to an FPIF contract is appropriate. Although FFP is generally the appropriate contract type when production is at a mature stage, DOD guidance and good contracting judgment require programs to assess elements such as actual cost data, cost estimating conditions, and production efficiency aspects to determine whether it is appropriate to continue using FFP, or whether a switch to FPIF would be more advantageous to the government.

Related to the recommendation to continue assessing production programs for appropriate FPIF use, we recommend that programs, and the DOD officials advising them, consider various aspects, in addition to cost and profit, when making contract type determination, such as schedule issues, effects on the warfighter, and funding impacts. We caution against focusing solely on cost impacts or profit percentages, as making a myopic decision can have wider-ranging impacts on non-cost factors. Such instances may include

- Programs should consider whether contracting delays have the potential to negatively impact the timing of fielding systems to the warfighter. In such cases, the schedule parameter may outweigh seeking what may be a comparatively small benefit in contract cost.
- When an effort is initially awarded as an FFP UCA, programs should weigh carefully whether there is much incentive actually available to the contractor. If the contractor has purchased a significant amount of material, or delivered a large quantity of hardware, their opportunities to implement efficiencies and realize cost savings may be greatly reduced. When a substantial portion of contract performance is already completed before definitization, FPIF may be an inappropriate contract type to effectively incentivize the contractor.
- Programs should consider the timing of incentive determinations and related impacts to funding. Several of the programs we studied were in peril of having their program funding expire for obligation before the final contract price would be determined. Once the funds are expired for obligation, the program and warfighter can no longer realize a benefit (the funds are returned to the Treasury).

The government should also consider the contractor's motivation when determining the contract type. By understanding the contractor's motivation, whether it be pure profit, experience or access to technology and future production contracts, the government can better tailor the contract type and the associated incentives to meet the needs of both parties.

2. Obtain actual cost data to support future program decisions

We recommend that DOD acquisition programs obtain actual cost data from previous production increments in order to inform future program decisions. While actual historical cost data is critical for programs contemplating a shift from FFP to FPIF in order to determine the variance between the negotiated costs and the contractor's incurred

costs, obtaining this data is a best practice for any program that is performing cost analysis and negotiating a fair and reasonable price based on cost or pricing data. In fact, FAR (2016) § 15.404-1(c)(2)(iii), which describes cost analysis techniques, lists comparing proposed costs with “actual costs previously incurred by the same offeror” first on the list of data to which proposed costs may be compared for reasonableness.

We believe it is likely that most MDAPs will already be receiving this type of actual cost data in the form of Cost and Software Data Reporting (CSDR). DOD Instruction 5000.02 requires contractors to provide CSDR submissions for ACAT I and IA programs on all major contracts valued at \$50 million or more (2015). Because the government receives this data as a contract deliverable at regular intervals during contract performance, this means some actual cost data is available to inform contract type decisions even if the current production increment is not complete. We further recommend that programs analyze this data as soon as practicable when planning for the next production increment to support proactive and prudent decisions about appropriate contract type. Establishing contract type and contractor expectations early may avoid the lengthy delays in negotiations like the ones experienced by the programs we studied.

3. Enhance Army workforce expertise in incentive contracting

The PEO Missiles and Space program management and contracting professionals we interviewed had no prior experience with analyzing, negotiating, or managing FPIF contracts. This lack of expertise is not unique to PEO Missiles and Space. A survey seeking interview sources within ACC-Warren (whose contracting workforce supports PEO GCS and PEO CS&CSS, among other customers) revealed that only five percent of contract price/cost analysts had experience negotiating FPIF contracts. We conclude that the Army workforce has a marked lack of experience in crafting, negotiating, and administering FPIF contracts.

Our recommendation to enhance Army workforce expertise in incentive contracting is twofold: training and sharing of lessons learned. First, we recommend that in-depth incentive contracting training be developed and provided by DAU that leverages the knowledge of subject matter experts in the field. Local command training programs, such as the ACC-Warren Acquisition Education Center, can also expand their incentive

contracting training to educate both contracting personnel and the program offices they support. Second, we recommend implementing a system for the robust sharing of lessons learned from programs and individuals experienced in using incentive contracts. The ACC Cost/Price Community of Practice website, which currently provides a repository of information that subject matter experts across all ACC locations can access, is a possible forum to provide such a capability. Contracting professionals could use this virtual space to exchange lessons learned, ideas, and success stories relating to incentive contracting topics.

4. Conduct additional research

Based upon our research, it is our overall determination that more data is needed and future research is warranted on the subject of program impacts resulting from the transition from FFP to FPIF type contracts. Although we attempted to cast a wide net, we were only able to identify a handful of programs that have transitioned from FFP to FPIF within three of the Army's PEOs for major weapon systems. We based our analyses on all data made available to us; however, our sample size was small and our research results are not generalizable to the overall population of major defense acquisition programs. Therefore, we suggest further research with a larger sample to provide more data points and permit further analysis. In addition, because the programs we studied had so recently transitioned to FPIF, we recommend future research with programs that have further or completed performance to assess the mid- and long-term program impacts of transitioning from FFP to FPIF.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A. COMPARISON OF MAJOR CONTRACT TYPES

	Firm-Fixed-Price (FFP)	Fixed-Price Economic Price Adjustment (FPEPA)	Fixed-Price Incentive Firm Target (FPIT)	Fixed-Price Award-Fee (FPAF)	Fixed-Price Prospective Price Redetermination (FPR)
Principal Risk to be Mitigated	None. Thus, the contractor assumes all cost risk.	Unstable market prices for labor or material over the life of the contract.	Moderately uncertain contract labor or material requirements.	Risk that the user will not be fully satisfied because of judgmental acceptance criteria.	Costs of performance after the first year because they cannot be estimated with confidence.
Use When . . .	The requirement is well-defined. •Contractors are experienced in meeting it. •Market conditions are stable. •Financial risks are otherwise insignificant.	The market prices at risk are severable and significant. The risk stems from industry-wide contingencies beyond the contractor's control. The dollars at risk outweigh the administrative burdens of an FPEPA.	A ceiling price can be established that covers the most probable risks inherent in the nature of the work. The proposed profit sharing formula would motivate the contractor to control costs and to meet other objectives.	Judgmental standards can be fairly applied by the fee determining official. The potential fee is large enough to both: •Provide a meaningful incentive. ¹ •Justify related administrative burdens.	The Government needs a firm commitment from the contractor to deliver the supplies or services during subsequent years. The dollars at risk outweigh the administrative burdens of an FPRP.
Elements	A firm-fixed-price for each line item or one or more groupings of line items.	•A fixed-price, ceiling on upward adjustment, and a formula for adjusting the price up or down based on: •Established prices. •Actual labor or material costs. •Labor or material indices.	•Ceiling price •Target cost •Target profit •Delivery, quality, or other performance targets (optional) •Profit sharing formula •120 % ceiling and 50/50 share are points of departure	•Fixed-price. •Award amount •Award fee evaluation criteria and procedures for measuring performance against the criteria	•Fixed-price for the first period. •Proposed subsequent periods (at least 12 months apart). •Timetable for pricing the next period(s).
Contractor is Obligated to:	Provide an acceptable deliverable at the time, place and price specified in the contract.	Provide an acceptable deliverable at the time and place specified in the contract at the adjusted price.	Provide an acceptable deliverable at the time and place specified in the contract at or below the ceiling price.	Perform at the time, place, and the price fixed in the contract.	Provide acceptable deliverables at the time and place specified in the contract at the price established for each period.
Contractor Incentive (other than maximizing goodwill) ¹	Generally realizes an additional dollar of profit for every dollar that costs are reduced.	Generally realizes an additional dollar of profit for every dollar that costs are reduced.	Realizes profit on cost by completing work below the ceiling price. May earn higher profit by incurring costs below the target cost or by meeting objective performance targets.	Generally realizes an additional dollar of profit for every dollar that costs are reduced; earns an additional fee for satisfying the performance standards.	For the period of performance, realizes an additional dollar of profit for every dollar that costs are reduced.
Typical Application	Commercial supplies and services.	Long-term contracts for commercial supplies during a period of high inflation.	Production of a major system based on a prototype.	Performance-based contracts.	Long-term production of spare parts for a major system.
Principal Limitations in FAR/DFARS Parts 16, 32, 35, and 52²	Generally NOT appropriate for R&D.	Must be justified.	Must be justified. Must be negotiated. Contractor must have an adequate accounting system. Cost data must support targets.	Must be negotiated.	MUST be negotiated. Contractor must have an adequate accounting system that supports the pricing periods. Prompt redeterminations.
Variants	Firm-Fixed-Price Level-of-Effort.		Successive Targets (FPIS), with ceiling and floor on firm target profit.		Retroactive Redetermination

Cost-Plus-Incentive-Fee (CPIF)	Cost-Plus-Award-Fee (CPAF)	Cost-Plus-Fixed-Fee (CPFF)	Cost or Cost-Sharing (C or CS)	Time & Materials (T&M)
Highly uncertain and speculative labor hours, labor mix, and/or material requirements (and other things) necessary to perform the contract. The Government assumes the risks inherent in the contract, benefiting if the actual cost is lower than the expected cost, or losing if the work cannot be completed within the expected cost of performance.				
An objective relationship can be established between the fee and such measures of performance as actual costs, delivery dates, performance benchmarks, and the like.	Objective incentive targets are not feasible for critical aspects of performance. Judgmental standards can be fairly applied. Potential fee would provide a meaningful incentive.	Relating fee to performance (e.g., to actual costs) would be unworkable or of marginal utility.	The contractor expects substantial compensating benefits for absorbing part of the costs and/or foregoing fee or the vendor is a non-profit entity.	No other type of contract is suitable (e.g., because costs are too low to justify an audit of the contractor's indirect expenses).
<ul style="list-style-type: none"> •Target cost •A minimum, maximum, and target fee •A formula for adjusting fee based on actual costs and/or performance •Performance targets (optional) 	<ul style="list-style-type: none"> •Estimated cost •Base amount, if applicable, and an award amount •Award fee evaluation criteria and procedures for measuring performance against the criteria 	<ul style="list-style-type: none"> •Estimated cost •Fixed fee 	<ul style="list-style-type: none"> •Total estimated cost •No fee •If CS, an agreement on the Government's share of the cost. 	<ul style="list-style-type: none"> •Ceiling price •A per-hour labor rate that also covers overhead and profit •Provisions for reimbursing direct material costs
Make a good faith effort to meet the Government's needs within the estimated cost in the Contract, Part I the Schedule, Section B Supplies or services and prices/costs.				Make a good faith effort to meet the Government's needs within the ceiling price.
Realizes a higher fee by completing the work at a lower cost and/or by meeting other objective performance targets.	Realizes a higher fee by meeting judgmental performance standards.	Realizes a higher rate of return (i.e., fee divided by total cost) as total cost decreases.	If CS, shares in the cost of providing a deliverable of mutual benefit.	
Research and development of the prototype for a major system.	Large scale research study.	Research study.	Joint research with educational institutions.	Emergency repairs to heating plants and aircraft engines.
The contractor must have an adequate accounting system. The Government must exercise surveillance during performance to ensure use of efficient methods and cost controls. Must be negotiated. Must be justified. Statutory and regulatory limits on the fees that may be negotiated. Must include the applicable Limitation of Cost clause at FAR 52.232-20 through 23.				D&F required (w/ HCA if over 3 years). Government MUST exercise appropriate surveillance to ensure efficient performance. Document any ceiling increases.
		Completion or Term.		Labor Hour (LH)

¹ Goodwill is the value of the name, reputation, location, and intangible assets of the firm.

² Comply with any USD (AT&L), DPAP or other memoranda that have not been incorporated into the DFARS or DOD Directives or Instructions”

Source: Defense Acquisition University (2012).

APPENDIX B. INTERVIEW QUESTIONS

- 1.** Name of program?
- 2.** Description of program (hardware, software, services, etc.)?
- 3.** What is the dollar value of the current contract?
- 4.** Did the program previously use an FFP contract?
- 5.** When did the program switch from FFP to FPIF?
- 6.** What prompted the switch to FPIF?
- 7.** How many FPIF contracts has the program used?
- 8.** Has the program realized any benefits from switching to FPIF?
- 9.** What challenges has the program encountered in using FPIF?
- 10.** How is contract administration more/less difficult than using FFP?
- 11.** If possible, quantify the benefit (in dollars) vs. using FFP?
- 12.** Does the program anticipate receiving benefits that have not yet been realized?
- 13.** If so, what is preventing the program from realizing a benefit currently?
- 14.** What was the contractor's reaction to the change in contract type?
- 15.** What was the contractor's actual profit rate under previous FFP contracts?
- 16.** What is the contractor's actual profit rate since switching to FPIF?
- 17.** What ACAT level is your program?
- 18.** When did your program enter FRP?

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C. INTERVIEW RESULTS

1. PROGRAM A

Met with Contract Program Analyst and Contracting Officer

Background

Program A is a product within PEO Missiles and Space. They are an ACAT IC program that has technically been in the Operations and Sustainment phase of the life cycle for quite some time. Their contracts serve as a mechanism for procuring hardware (mainly) and some limited amount of services and ILS from Contractor 1. Due to fluctuating requirements, their contracting approach is for a single year procurement. Over the last several procurements, each year has been awarded as an Undefinitized Contract Action (UCA) due to time constraints.

The Transition

For this program, the transition from FFP to FPIF occurred in 2015. They had awarded their FY14 procurement in December 2014 as an FFP UCA. During their OSD Peer Review, they were directed by Mr. Assad to change contract type to FPIF. This direction came when their Cost and Software Data Reporting (CSDR) Form 1921 data showed a realized profit of approximately 30% at both the prime and subcontractor levels on the previous contract. Upon flowing this direction to Contractor 1, the contractor notified the government that they would have to re-propose, adding six months to the delay. After sustaining a 12-month delay, this program successfully definitized their FY14 procurement as an FPIF contract in the first quarter of FY2016. Currently, they have their FY15 and FY16 procurements awarded under UCAs and are working to get these awarded as FPIF contracts.

The Pros and Cons

What are the positive aspects of this transition?

- Per the Contracting Officer, they are seeing more cost data that ever before.
- According to OSD analyses, their previous 30% realized profit has decreased to an actual profit of approximately 20%. However, all of the data has not been submitted to cover the completion of that contracting effort. Therefore, this data is incomplete as of today.

What are the negative aspects of this transition?

- Six days after contract definitization, the contractor notified the government of a cost overrun.
- Having previously been FFP, Earned Value Management (EVM) data had not been required. As an FPIF contract, this was a new requirement, so several things came in to play. First, the cost for Contractor 1 to submit this data was approximately \$500K per year. The government would need to have at least two people to review and analyze this data, which they did not have. Luckily, after 12 months, Program A was able to obtain a Class Waiver, thus eliminating this requirement.
- To date, all of the work for this contract has not been completed, therefore the incentive fee determinations have not been made. However, for an FY14 funded requirement, procurement funds will expire on 30 September 2016. If the contractor has not completed all of their work and submitted necessary data for analysis, this funding could expire. DOES THIS MAKE THEM ANTI-DEFICIENT SINCE THE FUNDS ARE ALL COMMITTED TO THE CONTRACT BUT UNOBLIGATED??
- Contractor A presented significant pushback to this transition. However, as stated, this contract was awarded as FPIF.

What are the anticipated benefits of this transition?

- Program A is hoping for a decrease in the profit percentage. Currently, the contractor's cost data shows they are tracking toward a decrease of approximately 10%. However, this could change as the contractor still has not completed all of the work.

Table 2. Program A Impacts of Transitioning from FFP to FPIF

Impacts of Transitioning from FFP to FPIF		
<i>Program A</i>		
Short Term	Mid Term	Long Term
* 12-month schedule slip in contract award * EVM now required * No previous knowledge of FPIF contract administration	* Seeing more cost data than historically * Early indications show a decrease in profit	* Not yet applicable

2. PROGRAM B

Met with Contract Program Analyst and Acquisition Business Chief

Background

Program B is a product within PEO Missiles and Space. They are an ACAT IC program that has technically been in the Operations and Sustainment phase of the life cycle for quite some time. This program entered Full Rate Production almost 50 years ago. Their contracts serve as a mechanism for procuring hardware from Contractor 2. This particular program has a multiyear contract, covering five years (FY12-16). Each year of this contract has been awarded as an Undefinitized Contract Action (UCA) due to time constraints. This means that deliveries for earlier years have already completed prior to definitization.

The Transition

For this program, the transition from FFP to FPIF occurred in 2016. At this point, all five years of the multiyear contract had been awarded until one large (\$1B+) UCA. Each year, the UCA was amended to add on additional quantities for that year's procurement requirement. During their OSD Peer Review, they were directed by Mr. Assad to change contract type to FPIF. This direction came due to lack of CSDR 1921 data that could be used to verify that the proposal costs were sufficient. This direction recently occurred and Program B is currently waiting on the contractor to submit a pricing update to their proposal. At that point, the government will begin negotiations with Contractor 2. Given that Contractor 2 has expressed disagreement with the FPIF approach, since a significant amount of work has been completed and all the contract deliverables awarded under an FFP UCA, it is unknown at this time what further impacts will occur relative to the award timeline .

The Pros and Cons

What are the positive aspects of this transition?

- At this time, Program B has been unable to realize any benefits of this transition.

What are the negative aspects of this transition?

- The beginning of negotiations were delayed in order to wait on the contractor to submit a pricing update.
- Having previously been FFP, Earned Value Management (EVM) data had not been required. As an FPIF contract, this was a new requirement. At

this time, this program does not have personnel with the expertise of evaluating and managing this data. It is likely that they will proceed with requesting a waiver for this requirement.

- Program B does not have any experience in managing FPIF type contracts.
- As explained, this MY contract has been awarded in its entirety as an FFP UCA. A good portion of the deliveries associated with this award have already been delivered to Program B. Therefore, there is not a clear understanding of how it will benefit the government to award as FPIF. Additionally, there is no way for Program B to realize savings on expired money as any funding removed is already expired for the purposes of obligation and cannot be used for other purposes or programs.

What are the anticipated benefits of this transition?

- Program B is hoping for a decrease in the profit percentage.

Table 3. Program B Impacts of Transitioning from FFP to FPIF

Impacts of Transitioning from FFP to FPIF		
<i>Program B</i>		
Short Term	Mid Term	Long Term
<ul style="list-style-type: none"> * EVM now required * Delay in negotiations * No way to realize savings from expired funding on UCAs. * No previous knowledge of FPIF contract administration 	<ul style="list-style-type: none"> * Not yet applicable 	<ul style="list-style-type: none"> * Not yet applicable

3. PROGRAM C

Met with Contract Program Analyst and Acquisition Business Chief

Background

Program C is a product within PEO Missiles and Space. They are an ACAT IC program that has been in the Operations and Sustainment phase of the life cycle for quite some time. This program entered Full Rate Production just over 20 years ago. Their contracts serve as a mechanism for procuring hardware from Contractor 3. This particular program has 3 year contract (FY13-15).

The Transition

For this program, there has been no transition. During their most recent contract award and peer review, concern was expressed early on by OSD that there would be a potential recommendation/direction to transition from FFP to FPIF. Program C was able to defend their cost analyses with supporting information from the contractor via their CSDR 1921 data. This proved to be very influential in the review with OSD. This program had a realized profit percentage of approximately 15%.

4. PROGRAM D

Met with Contract Program Analyst and Program Assistant Product Manager

Background

Program D is product within PEO Missiles and Space. They are an ACAT IC program that has technically been in the Operations and Sustainment phase of the life cycle for quite some time. Their contracts serve as a mechanism for procuring hardware from Contractor 4. This particular program has three production contract (FY15-17) for hardware only. A drastic change in user requirements resulted in the first year being awarded as an Undefinitized Contract Action (UCA).

The Transition

For this program, the direction to make this transition from FFP to FPIF occurred in 2016. This decision was made at a local level, prior to going to the OSD Peer Review. It was the determination of the Director of Army Contracting Command, Redstone Arsenal to make this transition. Shortly following this decision, this path forward was briefed at the OSD Peer Review and given the support of Mr. Shay Assad. This decision was made based upon a few data points. First, this program was not yet receiving CSDR 1921 cost data. Second, the pricing analysis showed suppliers were realizing excessively high profit percentages. Finally, the pricing analysis showed the prime contract had realized a 30% profit percentage previously. Based upon these three points, one might think it a clear cut reason for transition from FFP to FPIF for more visibility. However, it was the contention of Program D that this realized profit was skewed due to some non-recurring efforts being done under this contract type. Additionally, although they did not have CSDR 1921 data at the time of decision, the data is part of the contract. Currently, negotiations are underway for this program, but Contractor 4 has yet to provide a counteroffer in an FPIF format and still contends it should be FFP. Therefore, it is not yet known how this will be resolved between the two parties.

The Pros and Cons

What are the positive aspects of this transition?

- At this time, Program D has been unable to realize any benefits of this transition.

What are the negative aspects of this transition?

- The beginning of negotiations were delayed in order to wait on the government to establish an FPIF offer.

- Having previously been FFP, Earned Value Management (EVM) data had not been required. As an FPIF contract, this was a new requirement. At this time, this program does not have personnel with the expertise of evaluating and managing this data. It is likely that they will proceed with requesting a waiver for this requirement.
- Program D does not have any experience in managing FPIF type contracts.
- Currently, it is the perception of Program D that the ability to realize benefits to the warfighter due to any contract underruns will be impossible. Currently, this contract is a 3 year contract and the program receives procurement funding.

What are the anticipated benefits of this transition?

- Program D is hoping for a decrease in the profit percentage.

Table 4. Program D Impacts of Transitioning from FFP to FPIF

Impacts of Transitioning from FFP to FPIF		
<i>Program D</i>		
Short Term	Mid Term	Long Term
* EVM now required * Delay in negotiations * No way to realize savings from expired funding on UCAs. * No previous knowledge of FPIF contract administration	* Not yet applicable	* Not yet applicable

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Anderson, M. (2013, April 19). DOD war on profits? [Blog post]. Retrieved from <http://www.reliascent.com/government-contracting-blog/bid/96204/dod-war-on-profits>
- Blakey, M. (2011, April 19). DOD's war on profit. *Washington Business Journal*. Retrieved from http://www.bizjournals.com/washington/blog/fedbiz_daily/2011/04/dods-war-on-profit.html
- Buckshon, M. (2009, April). The change order boat: An Internet hit from Mississauga. *GTA Construction Report*. April 2009. Retrieved from <http://www.gtaconstructionreport.com/2009/04/>
- Butler, A. (2011, December). Pentagon: Affordability is not a war on profit. *Aviation Week & Space Technology*. Retrieved from <http://aviationweek.com/awin/pentagon-affordability-not-war-profit>
- Captain, T. (2016). 2016 Global aerospace and defense sector financial performance study. Retrieved from Deloitte Touche Tohmatsu Limited. <http://www2.deloitte.com/us/en/pages/manufacturing/articles/gx-mnfg-aerospace-and-defense-financial-performance.html#download>
- Carter, A. (2010a). Better Buying Power: Mandate for restoring affordability and productivity in defense spending [Memorandum]. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.
- Carter, A. (2010b). Better Buying Power: Guidance for obtaining greater efficiency and productivity in defense spending [Memorandum]. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.
- Chandler, S. (2014). Rethinking competition in defense acquisition. Retrieved from <http://lexingtoninstitute.org/wp-content/uploads/2014/11/Rethinking-Competition.pdf>
- Contract and Fiscal Law Department, The Judge Advocate General's Legal Center and School. (2014). *167th Contract attorneys course deskbook*. Volume II. Washington, DC: U.S. Army.
- Coombs, J. (2013, January 10). The hidden costs of firm-fixed price contracts. Integrity Matters. [Blog post]. Retrieved from <http://www.integritymc.com/blog/2013/01/the-hidden-costs-of-firm-fixed-price-contracting/>
- Coopers & Lybrand, TASC, Inc. (1994). *The DOD regulatory cost premium: A quantitative assessment*. Washington, DC: Author.

- Cuskey, J. (2015). Understanding the mechanics of FPIF contracts. APTAC Connection. Retrieved from <http://www.aptac-us.org/media/Dec-2015-Understanding-the-Mechanics-of-FPIF.pdf>
- Defense Acquisition University (DAU). (2012). Contract pricing reference guides. Volume 4. Retrieved from <https://acc.dau.mil/CommunityBrowser.aspx?id=379603#1.1>
- Defense Business Board. (2010). *Best business practices for fixed-price contracting* (Report FY10-03). Washington, DC: Author.
- Defense Business Board. (2014). *Innovation: Attracting and retaining the best of the private sector* (Report FY14-02). Washington, DC: Author.
- Defense Federal Acquisition Regulation Supplement (DFARS), 48 C.F.R. §§ 216, 252 (2016).
- Department of Defense. (2011). *United States Department of Defense fiscal year 2012 budget request program acquisition costs by weapon system*. Washington, DC: Office of the Under Secretary of Defense (Comptroller)/CFO.
- Department of Defense. (2013, September). Defense acquisition guidebook. Retrieved from <https://dag.dau.mil>
- Department of Defense. (2015, January). Operation of the defense acquisition system (DOD Instruction 5000.02). Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.
- Erwin, S. (2013, April). Pentagon, contractors clash over profits. *National Defense*. Retrieved from <http://www.nationaldefensemagazine.org/archive/2013/April/Pages/Pentagon,ContractorsClashOverProfits.aspx>
- Erwin, S. (2015, November 9). The state of the defense industry is strong but.... *National Defense*. [Blog post]. Retrieved from <http://www.nationaldefensemagazine.org/blog/lists/posts/post.aspx?ID=2012>
- Federal Acquisition Regulation (FAR), 48 C.F.R. §§ 15, 16, 31, 35 (2016).
- Feickert, A. (2016). *Joint light tactical vehicle (JLTV): Background and issues for Congress* (CRS Report No. RS22942). Retrieved from Congressional Research Service. <https://www.fas.org/sgp/crs/weapons/RS22942.pdf>
- Frick, D. (2013). Risk in fixed-price contracts. *Defense AT&L Magazine*. November-December 2013. Retrieved from <http://dau.dodlive.mil/files/2013/11/Frick.pdf>

- Garrett, G. (2009, October). Government contracting risk management: Common myths and best practices. *Contract Management*. National Contract Management Association.
- Gill, J. (2014, December). A war on profit in DOD contracting? It's all in the eye of the beholder. *Contract Management*. Retrieved from <http://staging.ncmahq.rd.net/docs/default-source/default-document-library/m/articles/cm1214---speaking-out>
- Gouré, Daniel. (2012). DOD cannot solve its budget woes by squeezing the defense industry. Retrieved from <http://lexingtoninstitute.org/dod-cannot-solve-its-budget-woes-by-squeezing-the-defense-industry/>
- Government Accountability Office (GAO). (1987). *AMRAAM cost growth and schedule delays* (GAO-87-78). Washington, DC: Author.
- Government Accountability Office (GAO). (2005). *DOD has paid billions in award and incentive fees regardless of acquisition outcomes* (GAO-06-66). Washington, DC: Author.
- Hildebrandt, G. (1998). The use of performance incentives in DOD contracting. *Acquisition Review Quarterly*. Spring 1998. Retrieved from <http://www.dau.mil/pubscats/pubscats/AR%20Journal/arq98/hilde.pdf>
- Joint Light Tactical Vehicle. (n.d.). In Wikipedia. Retrieved June 11, 2016, from https://en.wikipedia.org/wiki/Joint_Light_Tactical_Vehicle
- Kendall, F. (2011). Better Buying Power special issue foreword. *Defense AT&L Magazine*. September-October 2011. Retrieved from http://www.dau.mil/pubscats/ATL%20Docs/Sep-Oct11/DATL%20Sept_Oct11.pdf
- Kendall, F. (2012). Better Buying Power 2.0: Continuing the pursuit for greater efficiency and productivity in defense spending [Memorandum]. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.
- Kendall, F. (2013a). Implementation directive for Better Buying Power 2.0 – Achieving greater efficiency and productivity in defense spending [Memorandum]. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.
- Kendall, F. (2013b). Use of fixed-price incentive firm (FPIF) contracts in development and production. *Defense AT&L Magazine*. March-April 2013. Retrieved from http://www.dau.mil/pubscats/ATL%20Docs/Jan_Feb_2013/Kendall_Mar_Apr_2013.pdf.

- Kendall, F. (2015a). Implementation directive for Better Buying Power 3.0—Achieving dominant capabilities through technical excellence and innovation [Memorandum]. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.
- Kendall, F. (2015b). Tying profit to performance: A valuable tool, but use with good judgment. *Defense AT&L Magazine*. Retrieved from <http://dau.dodlive.mil/2015/04/21/tying-profit-to-performance-a-valuable-tool-but-use-with-good-judgment/>
- Mitchell, E. (2016). Meet the most hated man in the Pentagon. *Politico*. Retrieved from <http://www.politico.com/story/2016/04/defense-pentagon-spending-assad-221776>
- Obama, B. (2009, March). Government contracting [Memorandum]. Washington, DC: Office of the Press Secretary.
- Obama, B. (2010, April 28). Remarks by the president on Wall Street reform in Quincy, Illinois. Washington, DC: Office of the Press Secretary.
- Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy. (2013). Annual industrial capabilities report to Congress. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology and Logistics.
- Office of the Under Secretary of Defense, Acquisition, Technology, and Logistics (OUSD [AT&L]). (2016, April). Guidance on using incentive and other contract types. Washington, DC: Author.
- Profit. (n.d.) Merriam-Webster.com. Retrieved August 14, 2016, from <http://www.merriam-webster.com/dictionary/profit>
- S&P 500. (2016). Retrieved from <http://us.spindices.com/indices/equity/sp-500>
- Schmitt, E. (1991). Navy urges aid to aircraft's makers. *New York Times*. Retrieved from <http://www.nytimes.com/1991/01/03/us/navy-urges-aid-to-aircraft-s-makers.html>
- Smithberger, M. (2015, February 23). The unredacted truth about spare parts overcharges. Project on Government Oversight [Blog post]. Retrieved from <http://www.pogo.org/blog/2015/02/20150223-the-unredacted-truth-about-spare-parts-overcharges.html>
- Summers, W, IV. (2015). “Incentivizing” – An effective motivator? *Program Manager Magazine*. March-April 2015. Retrieved from <http://www.dau.mil/pubscats/pubscats/PM/articles95/summers.pdf>

- Systems Technology Project Manager. (n.d.). Retrieved August 14, 2016 from <http://jobs.johnsoncontrols.com/job-description/1569436/Systems%2BTechnology%2BProject%2BManager/Field%2BOperations/US%2B-%2BCA%2B-%2BHayward>
- Thompson, L. (2013). Defense industry profits are not impressive. *Forbes*. Retrieved from <http://www.forbes.com/sites/lorenthompson/2013/07/24/defense-industry-profits-are-not-impressive>
- Trice, R. (2011). Modestly-sized aerospace & defense sector is a major national asset. Lexington Institute. Retrieved from http://lexingtoninstitute.org/wp-content/uploads/2011/03/In_defense_of_Aerospace_and_Defense.pdf
- Thompson, M. (2014). The A-12: Admiral Peabody's ultimate wayback machine. *Time Magazine*. Retrieved from <http://swampland.time.com/2014/01/27/the-a-12-admiral-peabodys-ultimate-wayback-machine/>
- Twenty-five years of acquisition reform: Where do we go from here? Hearing before the Committee on Armed Services, House of Representatives, 113th Cong., 4 (2013) (testimony of Pierre Chao).*

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California