

NAVAL POSTGRADUATE SCHOOL Monterey, California



THESIS

**ANALYZING DEPARTMENT OF DEFENSE'S USE OF
OTHER TRANSACTIONS AS A METHOD FOR
ACCESSING NON-TRADITIONAL TECHNOLOGY**

by

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December 2001

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Report Documentation Page

Report Date 19Dec2001	Report Type N/A	Dates Covered (from... to) -
Title and Subtitle Analyzing Department of Defense's Use of Other Transactions as a Method for Accessing Non-Traditional Technology	Contract Number	
	Grant Number	
	Program Element Number	
Author(s) Gilliland, John	Project Number	
	Task Number	
	Work Unit Number	
Performing Organization Name(s) and Address(es) Naval Postgraduate School Monterey, California	Performing Organization Report Number	
Sponsoring/Monitoring Agency Name(s) and Address(es)	Sponsor/Monitor's Acronym(s)	
	Sponsor/Monitor's Report Number(s)	
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes The original document contains color images.		
Abstract		
Subject Terms		
Report Classification unclassified	Classification of this page unclassified	
Classification of Abstract unclassified	Limitation of Abstract UU	
Number of Pages 131		

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REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>
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 December 2001	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE: Analyzing Department Of Defense's Use of Other Transactions as a Method for Accessing Non-Traditional Technology			5. FUNDING NUMBERS
6. AUTHOR(S) Gilliland, John E.			
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.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE
13. ABSTRACT (maximum 200 words) As U.S. Defense budgets and military research and development spending experienced significant decline between 1988 and 1998, the Defense Technology and Industrial Base essentially merged with the national industrial base. DOD reform occurred more slowly than changes in the private sector fueled by advances in technology. U.S. national security relies upon the ability of the military to maintain technological superiority. To attract advanced technology companies that normally do not participate in defense business to the defense market, Congress provided a new contracting authority, Section 845 Other Transaction Authority (OTA). This study examines the effectiveness of its byproduct, Section 845 Other Transactions (OTs). Opinions and performance data regarding the effectiveness of Section 845 OTs were solicited from non-traditional companies that participated in OTs from 1994 to 2000. Significant disagreement was found within the Federal Government concerning the definition of a non-traditional company. It was also found that DOD does not quantify the amount of technology it accessed with OTs. Many of the non-traditional companies with which DOD participated in OT-based relationships came from markets where significant defense business already exists. In sum, DOD achieved uncertain and varied success in using OTs to achieve their stated purpose.			
14. SUBJECT TERMS Section 845, Other Transactions, Non-Traditional Defense Suppliers			15. NUMBER OF PAGES 131
			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 UL

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TRANSACTIONS AS A METHOD FOR ACCESSING NON-TRADITIONAL
TECHNOLOGY**

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the


**NAVAL POSTGRADUATE SCHOOL
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ABSTRACT

As U.S. Defense budgets and military research and development spending experienced significant decline between 1988 and 1998, the Defense Technology and Industrial Base essentially merged with the national industrial base. DOD reform occurred more slowly than changes in the private sector fueled by advances in technology. U.S. national security relies upon the ability of the military to maintain technological superiority. To attract advanced technology companies that normally do not participate in defense business to the defense market, Congress provided a new contracting authority, Section 845 Other Transaction Authority (OTA). This study examines the effectiveness of its byproduct, Section 845 Other Transactions (OTs). Opinions and performance data regarding the effectiveness of Section 845 OTs were solicited from non-traditional companies that participated in OTs from 1994 to 2000. Significant disagreement was found within the Federal Government concerning the definition of a non-traditional company. It was also found that DOD does not quantify the amount of technology it accessed with OTs. Many of the non-traditional companies with which DOD participated in OT-based relationships came from markets where significant defense business already exists. In sum, DOD achieved uncertain and varied success in using OTs to achieve their stated purpose.

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TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	GENERAL.....	1
B.	OBJECTIVES OF THE RESEARCH	4
C.	RESEARCH QUESTIONS.....	4
	1. Primary Research Question	4
	2. Secondary Research Questions.....	4
D.	SCOPE AND METHODOLOGY	5
E.	ORGANIZATION OF THE THESIS.....	6
F.	BENEFITS OF THE STUDY	6
II.	BACKGROUND	7
A.	INTRODUCTION.....	7
B.	THE MACRO ENVIRONMENT.....	8
	1. The Cold War Defense Era	8
	2. The Post Cold War Defense Era: A Revolution in Military Affairs.....	9
	3. The Post Cold War Defense Era: A Revolution in Business Affairs.....	12
	4. Changes in the Defense Technology and Industrial Base.....	13
C.	OTHER TRANSACTION AUTHORITY.....	17
	1. The Evolution of Other Transaction Authority	17
	2. Other Transaction Authority as it Exists Today.....	19
	3. Relevant Other Transaction Authority Definitions.....	21
	4. Section 845	23
	5. Use of Other Transaction Authority	26
D.	SUMMARY	30
III.	ATTRACTING NON-TRADITIONAL SUPPLIERS TO THE FEDERAL ACQUISITION MARKET	33
A.	INTRODUCTION.....	33
B.	BARRIERS TO ATTRACTING NON-TRADITIONAL COMPANIES	34
	1. Barriers - Pre Cold War.....	35
	2. Barriers - Post Cold War	36
	3. Barriers in the Defense Research and Development Market.....	38
C.	TECHNOLOGY ISSUES.....	40
	1. Federal Research and Development.....	41
	2. Industry Research and Development.....	43
	3. The Need for Accessing Non-Traditional Research and Development	44
	4. Elements of Other Transaction Agreements	47

D.	SUMMARY	48
IV.	SURVEY DATA PRESENTATION	51
A.	INTRODUCTION.....	51
B.	SURVEY BACKGROUND.....	52
1.	Methodology	52
2.	Pool.....	54
3.	Submission and Response	56
C.	SURVEY QUESTIONS AND RESULTS.....	56
1.	Companies Attracted.....	56
2.	Determining if the Other Transaction Attracted Them.....	63
3.	Tapping into Non-Traditional Technology.....	65
4.	Benefits of an Other Transaction	70
5.	Non-Traditional Arrangements and Practices.....	71
D.	SUMMARY	74
V.	DATA ANALYSIS.....	75
A.	INTRODUCTION.....	75
B.	NON-TRADITIONAL COMPANIES ATTRACTED	76
1.	Classification Issues	76
2.	Industry and Market Issues	78
C.	BENEFITS.....	80
1.	Tapping Into Commercial Research and Development	80
2.	Other Benefits.....	83
D.	AGREEMENT STRUCTURE.....	86
E.	SUMMARY	88
VI.	CONCLUSIONS AND RECOMMENDATIONS.....	91
A.	INTRODUCTION.....	91
B.	CONCLUSIONS	91
C.	RECOMMENDATIONS.....	97
D.	ANSWERS TO RESEARCH QUESTIONS	101
E.	SUGGESTED AREAS FOR FURTHER RESEARCH	105
	APPENDIX A – INTRODUCTORY SURVEY LETTER AND QUESTIONNAIRE	107
	LIST OF REFERENCES.....	113
	INITIAL DISTRIBUTION LIST	117

LIST OF FIGURES

Figure 1: U.S. Military Expenditure (in constant 1997 \$), from 1985 -1999 [Ref. 17: p. 1] ..	14
Figure 2: Total number of 10 U.S.C. 2371 (Research) OTs awarded and dollars obligated by DARPA from 1990 – 2001 [Ref. 25].....	26
Figure 3: Total number of Section 845 OTs awarded and dollars obligated by DARPA from 1994 – 2001 [Ref. 25]	27
Figure 4: Number of new Section 845 OTs awarded by DOD, from FY 94-00 [Ref. 23]	29
Figure 5: Dollar value of DOD Section 845 OT awards, from FY 94-00 [Ref. 23].....	29
Figure 6: Trends in Federal R&D Spending (in billions of constant FY 2000 dollars), from FY 1976-2001 [Ref. 35].....	42
Figure 7: Percentage of new OTs that include non-traditional company participants, from FY 94 – FY 00, [Ref. 23].....	55
Figure 8: Company’s Annual Sales Volume [Developed by Researcher].....	59
Figure 9: Determining If There Were Specific OT Provisions That Enabled Their Company’s Participation [Developed by Researcher].....	64
Figure 10: Identifying Whether Follow On Business With DOD Was Pursued After The OT-Based Relationship [Developed by Researcher]	67
Figure 11: Type Of Vehicle Used To Form Follow-On Relationships With DOD [Developed by Researcher].....	69

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LIST OF TABLES

Table 1: DOD’s Use of Section 845 Agreements from FY 1994 – FY 1998 [Ref. 6: p. 6] ...	28
Table 2: National Funds for R&D by Source of Funds (in millions) [Ref. 35: p. 6].....	44
Table 3: Companies’ Primary Product or Service [Developed by Researcher].....	57
Table 4: Companies’ Primary Industry [Developed by Researcher].....	58
Table 5: Companies’ Five-Year Average Annual R&D/Technology Budget [Developed by Researcher]	60
Table 6: Specific OT Provisions That Enabled Their Participation [Developed by Researcher]	65
Table 7: Percentage of Non-Traditional R&D Resources DOD Tapped Into – Before and After the OT Agreement [Developed by Researcher]	66
Table 8: Non-Traditional Supplier Perception of DOD Benefits [Developed by Researcher]	71
Table 9: Way In Which OTs Mirror Private Industry Business Relationships [Developed by Researcher]	72
Table 10: Areas Companies Consider When Evaluating New Relationships or Markets [Developed by Researcher].....	73

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I. INTRODUCTION

A. GENERAL

A dramatic decrease in U.S. defense spending since the end of the cold war coupled with private industry's incredible economic boom presents a unique problem for the Department of Defense (DOD). As DOD's purchases have declined, commercial markets have expanded, reducing DOD's spending role as a driving force for technological innovation. [Ref. 1: p. A20] During the Cold War era, a robust Defense Technology Industrial Base and DOD's seemingly unlimited budget for "in-house" research represented the bulk of the world's advanced science, research and technology efforts. What typically occurred during this era was that DOD would first identify the need for and develop "leading edge" science and technology innovations. Then this military technology would find its way into a commercial application and therefore, into private industry, ultimately forming the basis for commercial technological advancement. This process was referred to as "spinoff." [Ref. 2: p. 13]

Today, this scenario has reversed. Except in a few select areas, the Department of Defense no longer dominates advanced technology. [Ref. 2: p. 13] Many "leading edge" commercial technologies are being developed, fielded and deployed by private industry well in advance of DOD's requirements for the same technology. When DOD absorbs technology developed in the private sector, it is referred to as "spinon."

In today's tight defense funding environment, this role reversal has made it even more critical that DOD partner with industry in order to leverage their commercial practices and technological advances. If the United States is going to continue to lead the world's militaries in exploiting advanced technology and fielding/sustaining superior weapon systems, DOD will have to rely more and more upon the commercial industrial and technological base.

While on the surface, this doesn't appear to be much of a problem, nothing can be farther from the truth. A significant share of this technology has been unavailable to DOD because the companies who own it are unwilling to do business with the Government. For example, the Deputy Under Secretary of Defense (Acquisition

Reform), Stan Soloway stated in 1999: “Three quarters of the country’s top 75 or so information technology companies won’t do research for the military.” [Ref. 2: p. 14] Additionally, management consultant, Robert Spreng, commented:

A significant share of the most valuable research and development activity in commercial companies is virtually unavailable to the Federal Government, despite the potential benefits to both parties. [Ref. 3: p. 3]

Many studies have since been conducted in an effort to determine why these companies are unwilling to do business with DOD. [Ref. 2: p. 16] Consequently, the researchers have found that there were a variety of reasons why companies chose not to do business with the Government. While no simple or single answer could be determined, many believe that our Federal Acquisition system as a whole (or at least specific parts of it) are what drives private industry away from conducting business with the Government. [Ref. 3: p. 1]

Recognizing the seriousness of the situation, Federal Government Agencies, including DOD, have expended significant efforts over the last decade to correct this problem. In fact, much of these efforts have focused on developing innovative “business arrangements” that might attract to the Federal Acquisition market companies who previously would not do business with the Government (which are commonly referred to as “non-traditional” suppliers). Congress also recognized a need for enhancing the flexibility and reducing the burdens of Government funded research and technology contracts and in November 1993 included Section 845 in the DOD Authorization Act for Fiscal Year 1994. [Ref. 2: p.20] This legislation released the Defense Advanced Research Projects Agency (DARPA) and the Services from complying with Federal Acquisition statutes and regulations when contracting for prototype R&D projects. Over the next couple of years, this limited release from Federal Acquisition Regulation (FAR) compliance evolved into its current form, Other Transaction Authority (OTA).

The byproduct of OTA, an Other Transaction (OT) is the Government’s common phrase for all Title 10 U.S.C. 2371 authority to enter into transactions other than contracts, grants, or cooperative agreements. [Ref. 4: pp. 8] OTA was initially granted to DARPA and the Services as a temporary authority, with the hopes that it would convince

these non-traditional suppliers to do business with DOD. However, in 2000, Congress passed Section 803 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year (FY) 2001, which extended DOD's ability to use OTA for prototype projects through September 30, 2004. [Ref. 4: Section C1]

Evidence suggests that DOD immediately embraced this special authority and has consistently put it to use ever since it was granted. For the period from FY 1990 to FY 1997, DOD issued 210 OTs (for both research and prototype projects) agreements valued at just over \$3.4 billion. [Ref. 5: p. I] Of the 210 OTs that DOD issued during this period, 97 were of the Section 845 variety, meaning they were used to pursue prototype project development. It is also interesting to note that DOD's financial commitment for these 97 Section 845 OTs totaled \$2.6 billion, over three quarters of DOD's total financial commitments based on OTs. [Ref. 6: p. 1]

One stipulation to congressional approval of OTA is that DOD is required to submit an annual report to Congress on the Department's usage of OTA for that year (for both research and prototype project OTs). Even though DOD had not been required from 1994 to 2000 to maintain specific data (outside of the annual Congressional report) or track OT performance metrics, there was a largely held belief within DOD that OTs were successfully fulfilling their intended use. In April 2000, GAO conducted a study on DOD's usage of Section 845 OTs and noted the following:

In a February 1999 report to Congress, DOD cited numerous benefits from using Section 845 authority; these benefits included attracting firms that typically did not contract with DOD (e.g., non-traditional suppliers), providing more flexibility to negotiate agreement terms and conditions and reducing program costs. [Ref. 6: p. 1]

While it is true that the requirement for DOD to submit an annual OT usage report to Congress has existed since 1994, DOD was not required until FY 2001 to specifically track the involvement of non-traditional suppliers as a metric. In accordance with the Deputy Under Secretary of Defense for Acquisition, Technology and Logistics (DUSD (AT&L)) OT Guide for Prototype Projects, January 2001, any significant contribution expected of a non-traditional supplier must be documented in the OT agreement file and must be tracked as a metric via the DD 2579. [Ref. 4: p. 11]

B. OBJECTIVES OF THE RESEARCH

The purpose of this thesis is to provide a comprehensive analysis of DOD's use of OTA from 1994 to the present in an effort to determine the extent to which OTs have attracted non-traditional suppliers to do business with DOD and thus allowed DOD to tap into the private industry R&D and technology base.

C. RESEARCH QUESTIONS

1. Primary Research Question

To what extent has Other Transaction Authority (OTA) allowed Department of Defense (DOD) to attract non-traditional suppliers and tap into their previously unavailable Research and Development (R&D) and technology efforts?

2. Secondary Research Questions

Additional research questions are as follows:

What is the trend in DOD's investment in R&D over the last decade and how does it compare to private industry's investment trends in R&D?

Why is it important that DOD gain greater access to commercial R&D and technology resources?

What is the background and history of OTA and how does DOD use it today?

According to DOD, what are the most commonly perceived barriers to attracting non-traditional suppliers to the Government Acquisition market?

How do the non-traditional suppliers who have entered into business arrangements with DOD using Other Transactions perceive OTA as a means for overcoming these barriers?

From the non-traditional supplier's perspective, what general characteristics would a business arrangement need to contain in order to encourage them to allow DOD greater access to their R&D and technology efforts?

D. SCOPE AND METHODOLOGY

DOD business agreements based on Title 10 U.S.C. 2371 authority can generally be separated into two different types; OTs for Prototype Projects and OTs used to carry out basic, applied or advanced research projects. DOD's annual report to Congress on OT usage includes both types of OTs. However, it is the researcher's belief that adequate performance data on DOD's OTs used for basic, applied or advanced research projects since 1994 either does not exist or would be too difficult to obtain for the scope of this thesis. For that reason, the researcher chose to limit the scope of this thesis to all OT agreements for Prototype Projects made between DOD and non-traditional suppliers from Fiscal Years 1994 to 2000. Additionally, the author applied DUSD (AT&L)'s definition of a non-traditional supplier when characterizing OT recipients as either traditional or non-traditional.

To gain a better understanding of the legislative intent behind the development of OTA and the environment which OTA was created to address, the researcher first reviewed relevant literature, including but not limited to the following:

1. References, publications and electronic media available at the Naval Postgraduate School.
2. Published academic textbooks and research papers.
3. Internet websites and homepages (both DOD and academic).

To determine the extent to which OTA has allowed DOD to attract non-traditional suppliers and thus access previously unavailable parts of private industry's R&D and technology base, the researcher acquired from the DUSD (AT&L)'s office performance data on each OT agreement DOD awarded to non-traditional suppliers for prototype projects for the period 1994 – 2000. The analysis involved a survey of all suppliers who participated in OTs during this period and were classified by DUSD (AT&L) as non-traditional. All respondents were assured of anonymity. Additionally, telephone interviews were conducted with various agreement offices that administered OTs with non-traditional suppliers during this period. The general purpose of the survey was to determine the following:

1. Was it the OT that attracted these non-traditional suppliers to do business with DOD. Or, would they have done business with DOD regardless of whether an OT was used or not?
2. Were the non-traditional suppliers that DOD conducted business with using OT's the kind that DOD was trying to attract?
3. If the answer to question # 2 was yes, what percentage of their R&D and technology resources did DOD tap into?

E. ORGANIZATION OF THE THESIS

The thesis is divided into five chapters. Chapter I, the introduction, identifies the focus and purpose of the thesis, states the primary and secondary research questions and discusses the scope of research and the author's methodology. Chapter II presents the reader with background information on the defense and commercial industrial and technology bases since the end of the Cold War. This chapter also describes the history and legislative intent of Other Transactions and provides background on DOD's use of OTA over the last decade. Chapter III describes the challenges DOD faces while trying to attract non-traditional suppliers to the Federal Acquisition market and the importance of these efforts. Chapter IV summarizes background information concerning OT performance metrics and analyzes the information collected in the survey. And finally, Chapter V provides the study's principal conclusions, recommendations, answers to the research questions and identifies areas for future study.

F. BENEFITS OF THE STUDY

This thesis is intended to primarily benefit the drafters and users of Other Transaction Authority regulation, which are Department of Defense R&D activities and the Office of the Under Secretary of Defense (Acquisition, Technology & Logistics). A critical review of DOD's success in attracting non-traditional suppliers using OTs could yield valuable information about OTA as an innovative business arrangement and consequently, its benefit to the Federal Government.

II. BACKGROUND

A. INTRODUCTION

In an era not long ago, the United States military was the undisputed technological leader of the world. Throughout the last decade, however, this has become a heavily disputed belief. In the era when the U.S. military enjoyed world wide technological superiority, defense-related developments led American technology and often “spun-off” into the civilian sector, creating products and whole industries. This cycle reflected a U.S. defense posture based on using technical superiority to offset whatever advantages potential adversaries might have. [Ref. 7: p. 3]

Regardless of which industry, sector, or organization is in fact the technological leader of the world today, there is no doubt that the success of the United States’ defense rests on a strong, broad, dynamic base of research and development. Many experts believe that a nation’s productive and technological base have and always will be the foundation of their entire national power. This is not a new phenomenon. [Ref 8: p. 1] Advances in a nation’s technological base can fuel both economic and military prosperity.

What is new, at least for the United States, is the makeup of our technological base. Dramatic changes in the world’s political, economic and security environment over the last 10 years have resulted in remarkable transformations in the United States’ industrial and technological bases. The United States’ military is no longer operating in the same world that it was a decade ago. Threats have changed, budgets have changed, technological and industrial bases have changed, private industry has changed, and the workforce has changed. All of these changes have profoundly impacted the military’s ability to maintain comprehensive technological superiority.

This chapter provides background information regarding the new environment in which DOD operates today and sets the stage for later discussions regarding DOD’s need for greater access into the nation’s commercial technological base. This chapter begins by taking a look at the Post-Cold War defense era and the evolution of the U.S. Defense Technology Industrial Base in this era. The researcher will also provide background

information on OTA, including its history, general definitions, the congressional intent behind it and DOD's use of OTA since its inception.

B. THE MACRO ENVIRONMENT

1. The Cold War Defense Era

During the Cold War, the United States faced a single overarching threat that dominated every aspect of our military force planning and strategic thinking. We lived in a bipolar world, divided between the East and the West. Even though there loomed a very real potential for massive world destruction, the bipolarity of the situation actually resulted in more clarity and stability for the U.S. military. There was no question as to who the enemy was and relatively little question as to what it was going to take to defeat them. Much like many previous eras in American history, the military relied upon technologically superior systems to offset the Soviet Bloc's numerically larger forces. [Ref. 9: p. 1] U.S. military equipment was meaningfully and undeniably more sophisticated than that of the Soviet Union, and our allies sought American technology for their own defense efforts. American companies developed and sold high technology products to a world that could not produce them competitively. [Ref. 7: p. 3]

The Cold War period also saw a profound change in the relationship between Government and the industries on which it relied for the production of defense materials. A permanent state of war required a "permanent" Defense Industrial Base (DIB). Most of the "cutting edge" R&D efforts were being accomplished by the massive U.S. DIB and were focused on fielding superior weapon systems at any cost. The search for strategic and military advantage in the Cold War and the fear of being outpaced by our adversary technologically, created a demand by the Government for industry to push the envelope of advanced technology in the effort to develop superior weapon systems. Consequently, the Government invested heavily in the creation of a complex system of production facilities, depots and laboratories.

DOD investments in military R&D had little or no civilian application at the time they were developed, but represented the major force driving technological innovation in the U.S. Nevertheless, many private industry companies interested in engaging in

defense-related R&D had little commercial or technological imperative to remain entrenched in the broader national industrial base. [Ref. 10: p. 13] During the Cold War Era, the U.S. essentially had two industrial bases, a Defense Technology and Industrial Base and a National Commercial Industrial Base.

2. The Post Cold War Defense Era: A Revolution in Military Affairs

Few of the Americans alive at the time will ever forget the images of German youths hammering away at the Berlin Wall, the single most visible symbol of the end of the Cold War. This event in history marked a global transformation that, over ten years later, America is still struggling to fully comprehend. It was a remarkable time and it opened up possibilities previously unimaginable. But it also replaced the clarity and stability of the bipolar world with a less identifiable and less predictable international structure. The end of the Cold War brought forth visions of a less militarized world. In many people's eyes, these visions were quickly interpreted to mean that substantially lower levels of defense spending were now required. Without the threat of Warsaw Pact armored divisions racing across the North German Plain, many thought there would no longer be a requirement to maintain military forces of the size and strength justified during the Cold War. [Ref. 11: p. 1]

Yesterday's single-minded focus brought on by having a single overarching threat has been replaced today by new dangers, such as the proliferation of weapons of mass destruction, regional conflict, ethnic violence, and terrorism.

The security environment we live in is dynamic and uncertain, replete with a host of threats and challenges that have the potential to grow deadlier. We are not facing a few disorganized political zealots armed with pistols and hand grenades. Rather, we must defend against well-organized forces armed with sophisticated, deadly weapons and access to advanced information technology. They represent a different and difficult challenge to forces organized and equipped around traditional missions. [Ref. 12: p. 1]

As opposed to many of our nation's citizens who enjoyed an era of stability and incredible economic boom during the latter half of the 1990's, the U.S. military encountered an era of incredible uncertainty. Since the end of the Cold War, the primary

question military leaders have faced is how to counter the changing yet uncertain threats and keep ahead of any accelerated modernization undertaken by the adversaries that we expect to face in the early 21st century. Or more specifically, what kind of weapons and what size force structure will the military require in order to prevail over an unknown future enemy? How much defense is enough in the Post Cold War era?

Questions such as these sent military leaders and strategists back to the drawing board...several times. Clearly, it was hard to imagine that such uncertainties could be met with the same mix of Cold War weapons systems and the same doctrine that the military entered the 1990's with. One eventual result of the military leaders' efforts to adapt to the post Cold War security environment was what is now commonly referred to as the Revolution in Military Affairs (RMA) [Ref. 13: pp. 1-5].

The RMA is really a generic description for a collection of specific initiatives taken by military and Government leaders to revise their visions and strategies. One of the first attempts was the Bottom-Up Review (BUR). The BUR task forces represented a close collaboration between the civilian and military sectors of the DOD. The purpose of the BUR was to seize new opportunities by defining the strategy, force structure, modernization programs, industrial base and infrastructure needed to meet the post Cold War's new dangers. [Ref. 13: pp. 1-5]

Another significant evolution during the RMA was the development of the Chairman of the Joint Chief of Staff's document entitled Joint Vision 2010 [Ref. 9: p. 2]. Joint Vision 2010 was formulated in response to the Clinton Administration's 1996 National Security Strategy. It was essentially a conceptual template that provided a common direction to help the Military Services develop their unique capabilities within a joint framework of doctrine and programs. In this vision, the traditional concepts of maneuver, strike, protection and logistics are leveraged with technological advances and information superiority to produce improvements that are potentially so powerful that they become, in effect, new operational concepts. [Ref. 9: p. 3] It was thought by military leaders that these new operational concepts would interact to create the powerful, synergistic effect of full spectrum dominance, which is defined as the capability to dominate an adversary across the full range of military operations. Joint Vision 2010

also stated that in order for the military to achieve full spectrum dominance, it would have to combine information superiority with precision weapon delivery, which would ultimately result in total battle space situational awareness.

As the decade wore on, military leaders acted further in the belief that the world had become a dangerous place despite the lack of a super power challenger such as the Soviet Union. In 1997, then Secretary of Defense Cohen released his Report of the Quadrennial Defense Review (QDR). The 1997 QDR recognized many of the positive side effects of peace in the Post Cold War Era, but founded its projections on a core belief that the world remains a dangerous and highly uncertain place. Secretary Cohen's projection of the security environment rested on two fundamental assumptions: that the U.S. will remain politically and militarily engaged in the world over the next 15 to 20 years and that it will maintain military superiority over current and potential rivals, whomever they are. Additionally, the 1997 QDR projected that regional dangers will continue to exist, the U.S. homeland is not free from external threats, U.S. interests and citizens will continue to be challenged and placed at risk and there will be a proliferation of advanced weapons and technologies internationally that will increase the danger of asymmetric attacks on the U.S. [Ref. 14: pp. 1-4]

Much of the difficulty military and Governmental leaders faced during these RMA attempts to revise strategy and adapt to the new security environment stemmed from the absence of a precedent to build from. If they agreed on nothing else, military leaders agreed on the belief that the U.S. military was now operating in never seen before territory. Only the future can accurately define when the RMA is officially over. But the doctrine and strategy that derived from the potential for an RMA reflected this view of DOD capabilities:

The U.S. military must be prepared to conduct multiple, concurrent, contingency operations worldwide. It must be able to do so in any environment, including one in which an adversary uses asymmetric means, such as nuclear, biological, or chemical weapons. U.S. forces must be organized, trained, equipped and managed with multiple missions in mind. [Ref. 12: p. 1]

As Joint Vision 2010 points out loud and clear, the key to achieving this type of full spectrum dominance will be the ability of U.S. forces to acquire the information superiority that enable it. All RMA visions, predictions and strategies are founded on the military's need to rely heavily on technologies in order to make the forces lighter, more mobile and more lethal. More specifically, this will require the military to be able to exploit the U.S.'s current leadership of computer, satellite and communication technology; and to support new concepts in acquisition, assimilation, integration, analysis, management, dissemination and communication of information from all sensors potentially of use in the battle space. [Ref. 15: p. 1]

3. The Post Cold War Defense Era: A Revolution in Business Affairs

In 1997, Defense Secretary Cohen announced the Defense Reform Initiative (DRI) to help pay for the Revolution in Military Affairs. [Ref. 12: p. 4]. The DRI was an effort to restructure the way DOD does business. In order to do so, it called for DOD to embark on a Revolution in Business Affairs (RBA). DRI's call for such a revolution was founded on the belief that our defense establishment had operated under outdated and outmoded policies, procedures and infrastructure. These attributes of the Defense establishment were designed to deal with a Cold War threat, and many of them are at least a decade out of date and far behind a private sector that restructured, revitalized, and is now competing strongly in a dynamic global marketplace. [Ref. 12: p. 4]

One key focus of the RBA is the recognized need to reduce cycle times in the development, procurement and updating of new and modified weapon systems. Clearly, the success of the RMA relies heavily on DOD's ability to maintain a technological advantage. But any technological advantage we might have will be quickly lost unless DOD can stay ahead of the enemy. Consequently, military leaders determined that there was a need to abandon traditional methods of acquiring advanced technology, traditional methods which during the Cold War era frequently resulted in 7 to 15 year cycle times.

DOD's acquisition community took the RBA "to heart" and went back to the drawing board with respect to the acquisition process. Recognizing that the current acquisition process was designed to produce Cold War era systems, acquisition

executives embarked on a journey of reform and re-wrote the DOD 5000 series, which is the military's principal acquisition document [Ref. 16: p. 1]. The purpose of rewriting the 5000 series was to provide a process that encourages fielding to the users the best systems with available technology that are supportable, interoperable and affordable in less time and at less cost. One objective of the new 5000 series was to achieve an average of five to seven year cycle time from program launch to production.

The new 5000 series also calls for evolutionary acquisition principles and performance-based requirements as replacements for the slower Cold War acquisition methods. Evolutionary acquisition methods rely more heavily on commercial technologies and products, particularly in subsystems and components. As opposed to building weapon systems around not yet developed technology, military leaders are now forced to create evolutionary acquisition programs that will result not only in systems being deployed more quickly, but also allow for them to be updated as more advanced technology becomes available. Consequently, the challenge facing acquisition executives now becomes accomplishing this in a marketplace dominated by civil-military industrial integration (rather than primarily military owned technology). [Ref. 16: pp. 1-2]

4. Changes in the Defense Technology and Industrial Base

Just a decade ago, performance was the benchmark for developing new weapon systems; today it is performance at affordable cost, more specifically, at a cost that will allow DOD to obtain the quantities required. Today, cost is a requirement that must be considered at every stage of the acquisition process, even while warfighters are focusing on enhancing weapon system performance. [Ref. 12: p. 5]

A decade of defense budget reductions forced an increasing emphasis on affordability as a leading investment factor. Defense spending and the size of the Defense Technology Industrial Base actually began to decline a few years before the Cold War was over. From its cold war peak, the defense budget was reduced by about 40 percent in real terms. Defense R&D outlays have declined at a similar rate, but procurement outlays dropped even more dramatically, from a 1990 high of \$99 billion (in constant FY 96 dollars) to approximately \$48 billion in 1996. Or for another perspective,

procurement spending dropped from an equivalent of 2.4 percent of the Gross Domestic Product (GDP) in 1990 to 0.6 percent in 1996. [Ref. 10: p. 15]

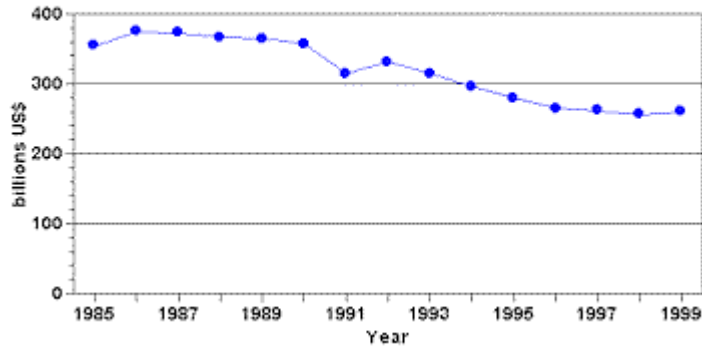


Figure 1: U.S. Military Expenditure (in constant 1997 \$), from 1985 -1999 [Ref. 17: p. 1]

The overall defense budget can be viewed as a balance between funding for today's forces (defined as readiness), funding to recruit, retain and equip the next force and funding to develop the technology for the force after the next (the latter two making up DOD's short and long term "modernization" accounts). Since the end of the Cold War, however, DOD has dealt with declining budgets by consciously slowing spending on force modernization and concentrating instead on maintaining current force readiness and quality of life issues. By most accounts, DOD was highly successful in maintaining current military readiness in the face of deep budget reductions. But the truth is that defense dollars do not go as far as they used to in the Cold War era.

On the acquisition side, weapons costs continue to grow, both from generation to generation and from initial estimates to actuals. The F-22 fighter will cost at least twice as much per airplane as the F-15 that it replaces and 20 percent more than the Air Force currently admits. On the support side, per-troop spending for operations and maintenance has grown in real terms by an average of more than three percent a year over the past 25 years. O&M now eats up more than 37 percent of DOD's budget, compared with 28 percent in the mid-1980's. [Ref. 18: p. 3]

While the market for defense products has gotten smaller, the cost of the technology needed to maintain the kind of advantage central to the RMA's success is

rising. Today's high tech weapons are becoming increasingly complex. For example, in today's combat aircraft nearly 50 percent of the final costs come from the avionics, sensors, fire control and weapon systems, components that a decade ago comprised barely 20 percent of the total costs. Twenty years ago, metal bending was the most lucrative stage in defense manufacturing. Today, the most lucrative and essential stage is the systems integration stage, which occurs when manufacturers integrate micro circuitry, sensors and high tech weapon systems into a complete platform. These trends are pinching the defense industry from both sides: while defense spending has fallen, the costs associated with developing, producing and integrating new generations of high technology weapon systems are increasing. [Ref. 8: pp. 14-15]

DOD's dramatic decrease in procurement spending over the last decade had equally dramatic effects on the Defense Technology and Industrial Base. As mentioned previously, during the Cold War DOD often developed its own technology, or its own version of non-defense technology for use in military products. Practically speaking, during the Cold War DOD funded and sustained a permanent defense industry that was set apart from the national industrial base. When DOD slowed down total defense and procurement spending after the Cold War, private sector defense contractors reacted to the slow down by dismissing large numbers of civilian workers and expanding sales into civilian markets. Those defense companies that did not adapt, chose either to exit the defense industry, go out of business or were bought out by larger companies. In 1991, there were \$300 million worth of defense industry mergers and that total has climbed to an annual rate averaging some \$10 billion since 1994. During this process of downsizing, more than two million jobs were eliminated in the defense sector. [Ref. 8: p. 2]

Defense budget reductions and infrastructure downsizing not only reduced the size of the Defense Technology and Industrial Base down to a small number of prime contractors, but also dramatically changed the character of the defense contractors as well. The reorganization of the Defense Technology and Industrial Base in the 1990's was more than a simple shedding of excess capacity and redundant workers. The surviving defense companies have become integrated, broadly capable defense primes that have the resources and experience to compete across the spectrum of defense

requirements and in the high-technology commercial marketplace. [Ref. 8: pp. 16-18] Today, prime and subcontractors that do business for DOD have much more varied customer bases than in the past. For one, a much larger portion of their current markets are devoted to commercial customers. Secondly, many of their same products can now be sold without much, if any, alteration to both DOD and commercial customers [Ref. 10: p. 15]. Consequently, defense contractors have had to become more vertically integrated, much like their private industry counterparts. In order to be more competitive and meet DOD's simultaneous demands for performance and affordability, prime defense contractors have begun to rely more heavily on commercial suppliers and commercial practices.

It's not surprising given the spectacular changes that occurred amongst the individual defense contractors that the character of the entire Defense Technology and Industrial Base would change as well. At the same time as the Cold War was reaching an end, a world-wide technology revolution was taking place, particularly in areas associated with information and communications systems. As this occurred, the commercial industrial base (also known as the national industrial base) seized the opportunities created by these new technologies and began a process of technological and organizational innovation that far outstripped the ability of the Government to innovate. [Ref. 8: p. 16]

The larger commercial divisions of the traditional defense industry contractors were also heavy participants in the commercial industrial base revolution/explosion [Ref. 10: p. 18]. Not surprisingly, today's commercial sector now leads the innovation in many of the technical areas most critical to implementation of the military's RMA visions and strategies. Not only has the relationship between private industry and DOD changed, but also the distinction between a separate national industrial base and a Defense Technology Industrial Base has virtually gone away. Increasingly, the nation is moving away from the idea of a unique Defense Technology and Industrial Base to a reliance on a broader national industrial base, some elements of which have unique competencies in defense-related activities, but the majority of which are large companies with significant, even dominant commercially oriented activities. [Ref. 8: p. 17]

C. OTHER TRANSACTION AUTHORITY

Although Other Transaction Authority (OTA) has been available to DOD and other Federal agencies for a number of years now, it continues to be a mystery to many Federal acquisition executives. In order to adequately analyze DOD's use of OTA with respect to its legislative intent, this researcher feels that it is important to review how the authority has evolved since its inception. OTA is the term used to generally label all transactions based on Title 10 of United States Code, Section 2371 (10 U.S.C. 2371) authority. However, 10 U.S.C 2371 authority covers many different areas. Therefore, this section will also specifically define major OTA principles and concepts. This section concludes with a discussion of DOD and other Federal Government Agencies' use of OTA since it was developed.

1. The Evolution of Other Transaction Authority

Contracts, grants, cooperative agreements and Other Transactions are among the many tools DOD has to support or acquire research. Title 10 U.S.C. 2371 is the legislation that specifically authorizes transactions **other than** contracts, grants, or cooperative agreements. Each of the Title 10 instruments was developed for different reasons and is not interchangeable, but rather is to be used according to the nature of the research and the type of Government/recipient relationship desired. Cooperative agreements, grants and OTs are classified as assistance instruments used by applicable Federal Agencies when the principal purpose is to stimulate or support R&D efforts for more public purposes. Contracts, on the other hand, are Federal Government procurement instruments, which means that they are used when the principal purpose of the project is the acquisition of goods and/or services. Perhaps more important though, is the fact that Federal Government contracts are governed by the Federal Acquisition Regulation (FAR) and DOD procurement regulations. In contrast, assistance instruments such as the ones authorized by 10 U.S.C. 2371 generally are not subject to the FAR or DOD procurement regulations, which gives Federal Agencies a considerable degree of flexibility in negotiating terms and conditions with the recipients. [Ref. 19: p. 4]

The first Government agency to identify a need for an alternate contractual approach was the Defense Advanced Research Projects Agency (DARPA, formerly known as ARPA). DARPA is a special DOD R&D organization, charged with the responsibility for managing and directing selected basic and applied DOD R&D projects and pursuing research and technology where risk and payoff are both very high and where success may provide dramatic advances for traditional military roles and missions. [Ref. 20] As the private industry technology industries began to explode in the late 1980's, DARPA recognized that they had a need for tapping into this explosion and consequently, sought a contractual approach to negotiating terms and conditions that was more flexible than the standard FAR contract or cooperative agreement. In direct response to DARPA's need, Congress enacted 10 U.S.C. 2371 in 1989, which authorized the use of "Other Transactions" for basic, applied and advanced research projects.

At the time, 10 U.S.C. 2371 was enacted as a temporary 2-year pilot program and its applicable authorities were given only to DARPA. [Ref. 5: p. 2] Additionally, the language codified in 10 U.S.C. 2371 did not specifically define "Other Transactions." This gave DARPA the flexibility it desired to structure business relationships without being constrained by traditional Federal acquisition statutes and regulations. As evidenced by the following quote taken from the legislation, Congress used such open-ended language clearly with the intent to give DARPA authority to stimulate, support or acquire commercial research and technology. [Ref. 2: p. 19]

The Secretary of Defense, in carrying out advanced research projects through the Advanced Research Projects Agency (ARPA), may enter into cooperative agreements and other transactions with any person, any agency or instrumentality of the United States, any unit of State or local Government, any educational institution, and any other entity. [Ref. 21]

The FY 1992 Defense Authorization Act broadened 10 U.S.C. 2371 authority by including the Military Services and made it permanent. However, this Act did add constraints on both DARPA and DOD's use of the authority. After 1992, in order to issue an OT, the issuing Government agency had to ensure that Government funding of the research did not exceed that provided by the non-Government parties to the maximum extent practical, and that the research did not duplicate research already being performed

within the Government. The Act further stated that OTs should usually be issued to a consortium consisting of private companies, not-for-profit agencies, universities and Government organizations and may be used when a standard contract, grant, or cooperative agreement is not feasible or appropriate. [Ref. 5: p. 2]

The FY 1994 Defense Authorization Act, Section 845, once again changed OTA [Ref. 6: p. 5]. Section 845 expanded OTA by allowing DARPA to use OTs for prototype projects that were directly relevant to weapons or weapon systems. Section 845 authority, however, was given solely to DARPA and even then, only on a 3-year “trial” basis. Interestingly enough, Section 845 did not provide specific objectives to be achieved from using OTA, nor did it define what constituted a prototype project. Furthermore, the Act did not require participants to share in the costs of the projects or require that the agreements be used when a standard contract, grant or cooperative agreement was not appropriate or feasible. [Ref. 6: p. 5]

A few years later, Section 804 of the FY 1997 Defense Authorization Act broadened Section 845 authority to include the Secretaries of the Military Departments and other officials designated by the Secretary of Defense and extended this authority out to September 30, 1999 [Ref. 5: p. 2]. Section 804 also stipulated that OTs being used for prototype projects (as opposed to basic, applied and advanced research projects) would not require cost sharing by the research participant(s), may be used even when a traditional contract would be feasible or appropriate and must be awarded using competitive procedures. [Ref. 5: p. 2] The General Accounting Office (GAO) noted the following:

At the time Section 804 was enacted, senior DOD officials indicated that extending OTA to the Military Services and Defense Agencies would, among other things, assist their efforts to attract firms that traditionally did not perform research for the Government and reduce the time necessary to field new weapon systems. [Ref. 6: p. 6]

2. Other Transaction Authority as it Exists Today

At this stage in a review of the history of OTs, it becomes apparent that awards pursuant to 10 U.S.C. 2371 authority have evolved down two distinctly different paths; those OTs which are awarded for the purposes of pursuing prototype projects directly

relevant to current or proposed weapons system and those OTs which are used to carry out basic, applied or advanced research projects. It is important to further discuss these two different types of OTs. The first type, OTs awarded for prototype projects (commonly referred to as Section 845 OTs), are authorized under the temporary National Defense Authorization Acts with sunset provisions found in the U.S. Code as a Note in 10. U.S.C. 2371, Section 845 of Public Law 103-160. It's also important to point out that the Government categorizes this type of OT as an acquisition instrument. DOD's Director of Defense Procurement (DDP) has been given the responsibility for managing Section 845 OT policy for DOD.

The second type, OTs used to carry out basic, applied or advanced research projects, is authorized under the permanent authority given by 10 U.S.C. 2371. Agreements reached under this authority are commonly referred to as Technology Investment Agreements (TIAs). The Government treats research OTs as assistance instruments and assigned the Director of Defense Research and Engineering (DDR&E) responsibility for managing 10 U.S.C. 2371 OT policy for DOD. [Ref. 22] The Defense Grant and Agreement Regulatory System (DGARS) governs awards made for assistance or other non-acquisition purposes using 10 U.S.C. 2371 authority, whereas, Section 845 OTs are subject only to guidance issued by DDP and are not subject to DGARS.

The most recent amendment to Section 845 OTA, Section 803 of the FY 2001 Defense Authorization Act, extended DOD's temporary Section 845 authority out to September 30, 2004 and established new conditions for the appropriate use of the authority. [Ref. 4: Section C1] Specifically, Section 803's new conditions include the following [Ref. 22]:

The Secretary of Defense shall ensure that no official of an agency enters into a transaction (other than a contract, grant or cooperative agreement) for a prototype project under the authority of this section unless...

1. There is at least one non-traditional defense supplier participating to a significant extent in the prototype project; or
2. No non-traditional defense supplier is participating to a significant extent in the prototype project, but at least one of the following circumstances exists:

- (a) At least one third of the total cost of the prototype project is to be paid out of funds provided by parties to the transaction other than the Federal Government.
- (b) The senior procurement executive for the agency determines in writing that exceptional circumstances justify the use of a transaction that provides for innovative business arrangements or structures that would not be feasible or appropriate under a contract.

Section 803 also included further additions to DOD's previous statutory direction on the use of Section 845 authority. For one, there is now language regarding Comptroller General audit responsibilities, which states that OTs for prototype projects that provide for total Government payments in excess of \$5,000,000 must include a clause that provides for Comptroller General access to the agreement file. Secondly, DOD must submit a report to Congress each year on the use of OTA and their compliance with Section 803's tenets described above. Section 803 also mirrored a few of the previous Section 845 OTA clauses. For example, Section 803 states that to the maximum extent practicable, competitive procedures shall be used when entering into agreements for prototype projects and no transaction entered into under this authority shall provide for research that duplicates research being conducted under existing DOD programs. [Ref. 4: Section C1.2]

3. Relevant Other Transaction Authority Definitions

As previously stated in Chapter I, this thesis will focus primarily on DOD's use of Section 845 OTA. As evidenced from the history of OTA legislation provided in the previous section, the concept has evolved significantly from its original form. Having said that, this researcher feels that it is beneficial to take a step back for a moment and further clarify some terms and concepts that will be used throughout the remainder of this thesis.

To begin with, OTA in general (meaning, regardless of whether the reference is to Section 845 prototype or 10 U.S.C. 2371 research OT authority) is best defined by what it is not. The product of OTA, an Other Transaction, is not a contract, grant or cooperative

agreement. Again, this means that OT agreements are not required to comply with traditional Government acquisition statutes, laws or regulations. However, OT agreements are legally binding instruments between the Government and their recipient(s).

Section 845 of the National Defense Authorization Act for FY 1994 granted DOD the authority to use OTs in pursuit of prototype projects that are linked to weapons or weapon systems. The statute, however, does not require that the prototype project be used specifically for the development of a weapon. Rather, the statutory requirement states that the project should be “directly relevant to weapons or weapon systems proposed to be acquired or developed.” [Ref. 22] DOD describes a prototype as a physical or virtual model used to evaluate the technical or manufacturing feasibility or military utility of a particular technology or process, concept, end item, or system. [Ref. 4: Section C1.6] While this may seem confusing, prototype projects can be better defined by identifying some of the things that are considered as part of a prototype project.

For example, prototype projects pursued using Section 845 OTA can include sub-systems, components, technology demonstrations and technologies of proposed DOD weapon systems. Furthermore, the language is broad enough to also include training, simulation, auxiliary and support equipment that is “directly relevant to weapons or weapon systems.” Low Rate Initial Production (LRIP) quantities are not authorized to be acquired using Section 845 authority. [Ref. 22]

The original spirit behind Congress granting 10 U.S.C. 2371 OTA to DARPA in 1989 was to give them the ability to tap into technology and R&D being accomplished by commercial industries, thus allowing DOD to pursue commercial solutions to defense requirements. That spirit is still highly evident in today’s OTA statutory language. In fact, this thesis will detail in later sections that one of the primary stated purposes of a Section 845 OT is to allow the Government to attract non-traditional suppliers who are at the “cutting edge” of technology. Therefore, it’s important to define non-traditional suppliers. According to DOD, a non-traditional supplier is:

A business unit that has not, for a period of at least one year prior to the date of the OT agreement, entered into or performed on (1) any procurement contract that is subject to full coverage under the cost accounting standards

prescribed pursuant to Section 26 of the Office of Federal Procurement Policy Act (Title 41 U.S.C. 422) and the regulations implementing such section; or (2) any other procurement contract in excess of \$500,000 to carry out prototype projects or to perform basic, applied or advanced research projects for a Federal agency. [Ref. 4: Section DL1]

4. Section 845

To help meet the Post Cold War national security challenges previously described, DOD funds a vast array of R&D activities to exploit emerging technologies, develop advanced weapon systems and improve the capabilities of fielded weapon systems. Over the past decade, Congress and DOD expressed concern that the Government acquisition system (which is implemented through specific contract provisions) inhibited DOD's ability to take advantage of technological advances made by the private sector, which ultimately will increase the cost of goods and services that DOD acquires. [Ref. 6: p. 3] In an effort to address this concern, Congress passed in 1989 Title 10 U.S.C. Section 2371, the piece of legislation that originally gave birth to OTA.

As OTA evolved throughout the 1990's, so to did its legislative intent. OTA started out simply as a means for providing DARPA the flexibility to access commercial technology without any of the constraints typically imposed upon acquisition executives by the Government acquisition system. In fact, at the time 10 U.S.C. 2371 authority was given to DARPA, the legislation specifically did not define "other transactions" so that it would give DARPA the flexibility to deal with unique situations encountered when fostering technology development, especially technology with both commercial and military applications. [Ref. 6: p. 5] Congress left the "defining" up to DARPA.

Interestingly enough, the legislation that authorized Section 845 OTA in the National Defense Authorization Act for FY 1994 included the same kind of ambiguity with respect to its intent. The legislation did not provide specific objectives to be achieved from using the authority, nor did it define what constituted a prototype project. Although this legislation did require DOD to report annually to Congress on its use of OTs, it did not define or require DOD to report on any specific performance metrics

related to use of OTA (not a surprise considering that no legislative objectives were given). [Ref. 6: p. 5]

Despite a lack of published legislative intent in the early years, DOD was quick to develop and point out what it thought Section 845 OTA's intended purpose was. In a 1996 General Accounting Office (GAO) Report on DOD's use of OT's, DOD officials cited three primary reasons for using OTA:

1. To help reduce the barriers to integrating the defense and civilian sectors of the industrial base.
2. To promote new relationships and practices within the defense industry.
3. To allow the Government to leverage for defense purposes the private sector's financial investments in R&D of commercial products and processes. [Ref. 19: p. 3]

In addition to the three primary purposes above, DOD officials cited other reasons for using Section 845 OTA. For one, there was a belief that OTs helped DOD to streamline acquisition practices or processes without having to apply for a waiver from statute/regulations. Secondly, DOD organizations were finding that OTs were extremely helpful while negotiating intellectual property provisions with contractors. Perhaps a good way to sum up all of the reasons why DOD used Section 845 OTA in the mid 1990's is to say that OTA was used to allow DOD to enter into business relationships that would otherwise be difficult or impossible to form using a contract. [Ref. 23]

The commercial technology explosion did not stop in the second half of the 1990's and DOD's budgets continued to decline up through FY 1998. As a direct response, DOD and Government officials continued their strong push for acquisition reform. DOD's temporary Section 845 OTA given under the FY 1994 Defense Authorization Act was twice extended (and is currently good through September 2004). Unlike the previous legislation, the most current extension to Section 845 OTA (enacted under Section 803 of the FY 2001 Defense Authorization Act) included amendments to the extension of the authority (each of the amendments was identified previously in Section 2). Clearly, Section 803 shifted the intent of the legislation to a sole focus on using OTA to attract non-traditional suppliers to do business with DOD. In a memo to

Secretaries of the Military Departments and Directors of Defense Agencies, then Under Secretary Gansler elaborated on this focus:

It is DOD policy to establish policies and programs that improve, streamline and strengthen DOD component technology access and development programs, encourage open-market competition and technology-driven prototype efforts that offer increased military capabilities at lower total ownership costs and faster fielding times, and exploit the cost-reduction potential of accessing innovative or commercially developed technologies. OTA for prototype projects is a vital tool that will help the Department achieve these objectives. [Ref. 24]

DOD reinforced this new legislative intent by incorporating the amendment's focus into its most recent "Other Transaction" Guide for Prototype Projects [Ref. 4: Section C1]. According to the Guide, DOD's **primary** reason for using Section 845 OTA is to tap into R&D being accomplished by non-traditional defense suppliers. More specifically, DOD would like to use OTA to attract non-traditional suppliers who are at the "cutting edge" of technology to the Government acquisition market and would like to do so without forcing these suppliers to change their existing business practices. The idea behind this is that these non-traditional suppliers will help DOD in their plight to pursue commercial solutions to defense requirements [Ref. 4: Section C1].

The Guide's definition of non-traditional supplier is not limited to the prime contractor level either. Rather, OTA should also be used to attract non-traditional suppliers at the level of prime, team members, subcontractors, and lower tier vendors or "intra-company" business units (provided the business unit makes a significant contribution to the prototype project). Now that DOD's primary reason to use the authority mirrors the major change in the legislation's intent, it is required (as of FY 2001) to track the involvement of non-traditional defense suppliers that participate to a significant extent in the prototype project as a metric and address it in its annual report to Congress. [Ref. 4: Section C1.5]

5. Use of Other Transaction Authority

DARPA, being the first agency to receive 10 U.S.C. 2371 OTA, leads the Government in the number of OT agreements awarded from FY 1990 to present. As previously mentioned, only the permanent authority pursuant to 10 U.S.C. 2371 to award OTs for basic, applied or advanced research projects was available to DARPA prior to FY 1994 (legislation authorizing Section 845 OTA for prototype projects wasn't developed yet). Even though the early 10 U.S.C. 2371 legislation seemingly "left the door wide open" for DARPA to use OTs at will, they did not utilize them very much until the mid 1990's. The following graph of DARPA's total number of OTs awarded and dollars obligated via OTs shows the progress in their use of 10 U.S.C. 2371 Research OTs over the years.

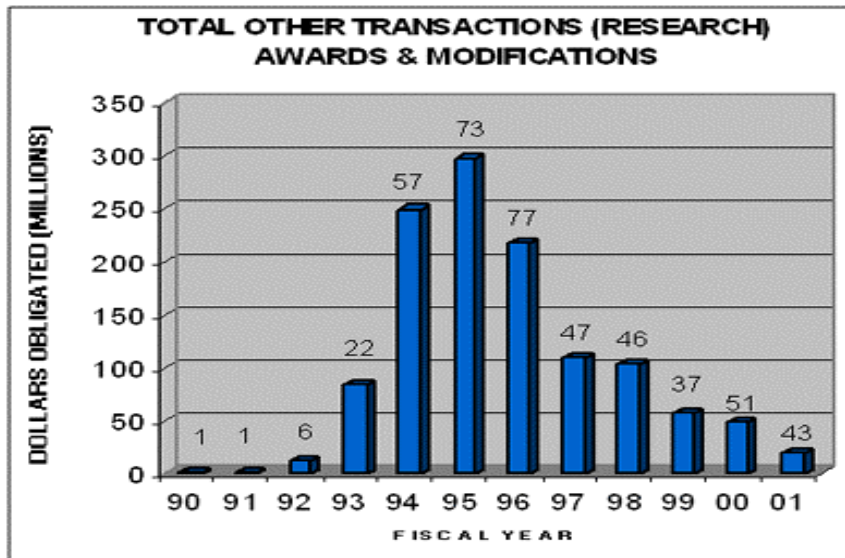


Figure 2: Total number of 10 U.S.C. 2371 (Research) OTs awarded and dollars obligated by DARPA from 1990 – 2001 [Ref. 25]

As the graph above indicates, DARPA's usage of OTs did not pick up until 1993, which consequently was about the time the legislation for the FY 1994 Defense Authorization Act giving them the authority to use Section 845 OTs for prototype projects was being drafted. DARPA's early usage of Section 845 OTs followed a similar pattern to their usage of 10 U.S.C. 2371 Research OTs (e.g., they awarded a greater

number and for a larger dollar amount each subsequent year). DARPA’s first use of Section 845 OTA was for the High Altitude Endurance Unmanned Ariel Vehicle (HAE UAV), which at the time was an Advanced Concept Technology Demonstration (ACTD) Project. Other notable projects that DARPA used Section 845 OTs for were the Arsenal Ship program and the Affordable Mutli-Missile Manufacturing program. [Ref. 26: Section V-B] The following graph depicts DARPA’s total number of Section 845 OTs awarded and dollars obligated using them.

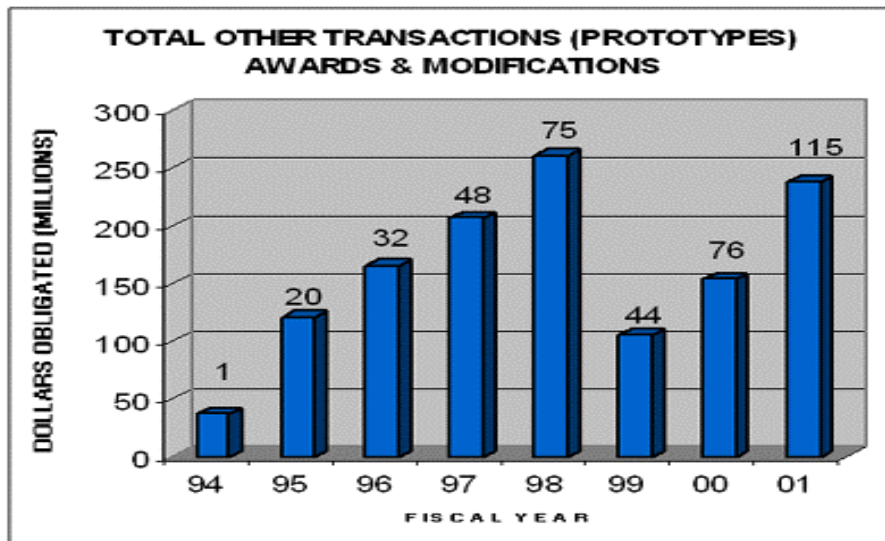


Figure 3: Total number of Section 845 OTs awarded and dollars obligated by DARPA from 1994 – 2001 [Ref. 25]

The Services began to use 10 U.S.C. 2371 authority to award OTs in 1994, which is when DDR&E issued interim guidance for Military Departments and DARPA on the use of grants, cooperative agreements and “other transactions.” However, for the first couple of years, the Services chose to award more cooperative agreements than OTs as the legislation’s language at the time stated that OTs could **only be** used when a standard contract, grant or cooperative agreement was not feasible. [Ref. 26: Section V-A]

As of FY 2000, DOD awarded 245 Section 845 OT agreements that varied in type and dollar value. Almost immediately after the Services were given Section 845 OTA in 1997, their use of prototype OTs surpassed DARPA’s usage. In just the first two years of having the authority (1997 & 1998), the Services awarded 57 Prototype OTs, which accounted for nearly two-thirds of the total agreements awarded by DOD. The Services’

initially high use of Prototype OTs was largely due to the Commercial Operations and Support Savings Initiative (COSSI), a DOD initiative intended to reduce maintenance costs of fielded weapon systems by using commercial products and processes. DOD made the use of Section 845 OTs a requirement for this initiative. Additionally, the Services' use of Section 845 OTs skyrocketed in FY 1999 as DOD encouraged its use in the pursuit of dual-use technology projects. [Ref. 6: p. 6] The following table presents a breakdown by individual DOD component of their use of Section 845 Prototype OTs in the early years.

Component	1994	1995	1996	1997	1998	1999
Army				10	3	13
Air Force				8	5	13
Navy				20	11	31
DARPA	1	6	8	4	15	34
Total	1	6	8	42	34	91

Table 1: DOD's Use of Section 845 Agreements from FY 1994 – FY 1998 [Ref. 6: p. 6]

DOD has used Section 845 OTA over the years to support a wide range of projects. For example, more than half of the projects that Section 845 OTs were used for involved either (1) studies to evaluate the feasibility or merits of future weapon systems concepts/technologies or (2) the design and development of hardware-related subsystems and components. Section 845 OTs have also been used to support the development of software, information systems and various imaging and detection technologies. Interestingly enough, a few prototype projects that used OTs will result in the development and manufacture of a major end item (for example, a new oceanographic research ship for the Navy). [Ref. 6: p. 7]

While it is true that DOD has increased its number of Section 845 OTs awarded over the last few years, the total dollar value of its obligations as compared to total DOD dollars obligated to R&D activities using traditional contracts remains very small. As of October 1998, DOD's total financial commitment using Section 845 OTs (from FY 1994 – FY 1998) totaled \$2.6 billion, a very small amount compared to the \$100 billion spent

by DOD on R&D using traditional contracts during the same period. Interestingly enough, of the \$2.6 billion obligated using OTs, \$2.1 billion (over 80 percent) was concentrated in just 10 out of a total of 97 agreements. [Ref. 6: p. 4]

Recent data does, however, indicate that DOD's use of Section 845 OTs (both in number of agreements made and dollar value of awards) over the last two fiscal years has risen sharply. The following graphs present both the number of new Section 845 OTs awarded by DOD each year and the associated total dollar value per year obligated.

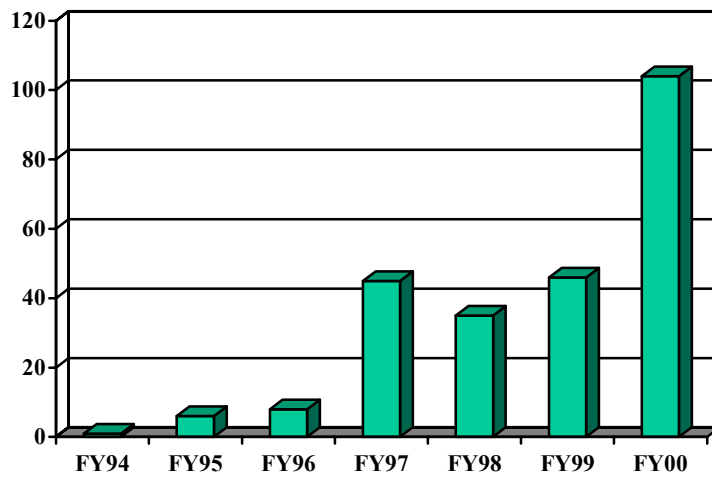


Figure 4: Number of new Section 845 OTs awarded by DOD, from FY 94-00 [Ref. 23]

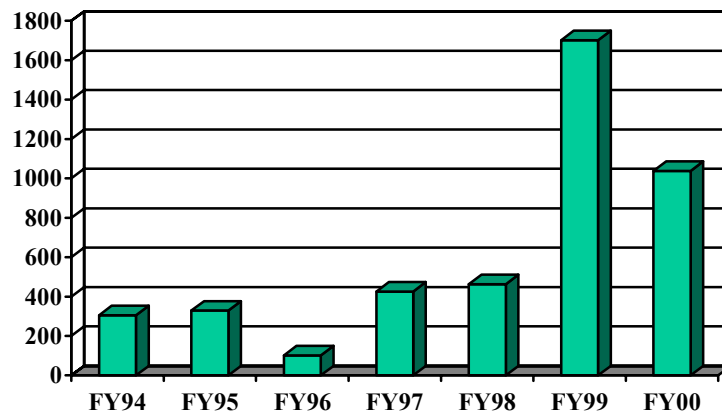


Figure 5: Dollar value of DOD Section 845 OT awards, from FY 94-00 [Ref. 23]

D. SUMMARY

DOD has spent much of the last decade scrambling to adapt to the “new world order.” The economic prosperity of the 1990’s and the absence of a super power challenger have completely changed the security environment for DOD. During the old Cold War era, the world was burdened by the constant threat of nuclear annihilation. Our adversaries and their capabilities were well known to us. The U.S. military owned and drove the advancement of “cutting edge” technology and Defense budgets were enormous.

Today DOD is operating in an environment characterized by unknown yet highly lethal adversaries, lightening fast commercial technological advancement cycles and reduced defense budgets as compared to the Cold War period. Private industry has enjoyed a decade of success as a result of its incredible ability to adapt, transform and remain competitive in the “new world order.” DOD is attempting to do exactly the same thing as it embarked on a Revolution in Military Affairs. Presently, not even the highest Government and Military officials can say with complete confidence what the military force necessary to accomplish our future national security strategies will look like. They can say, however, that superior technology will be the foundation of that future military force. This belief is clearly demonstrated in the following quote from DOD’s FY 2000 Science and Technology Strategy:

In peace, technological superiority is a key element of deterrence. In crisis, it provides a wide spectrum of options to the national command authorities and commanders in chief, while providing confidence to our allies. In war, it provides an edge that enhances combat effectiveness, reduces casualties and minimizes equipment loss. In view of declining defense budgets and manpower reductions, advancing affordable military technology and ensuring that it undergoes rapid transition to the warfighter are critical national security obligations. [Ref. 27: p. 14]

Congress and Government acquisition executives developed OTA legislation in order to assist DOD in its efforts to leverage the commercial technological explosions occurring in private industry. By offering an alternative to traditional FAR-type contracts, DOD officials are attempting to attract the most technologically advanced non-

traditional suppliers to the DOD acquisition market with the hope of using these new relationships to field more capable weapon systems faster and with lower total ownership costs.

The next chapter will explore in more detail specific issues surrounding DOD's attempts to attract non-traditional suppliers to the DOD acquisition market.

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III. ATTRACTING NON-TRADITIONAL SUPPLIERS TO THE FEDERAL ACQUISITION MARKET

A. INTRODUCTION

The underlying premise of DOD's visions and warfighting strategies is the belief that their ability to maintain technological superiority on the battlefield will directly depend on the acquisition community's ability to obtain and leverage the most advanced technologies available in the world [Ref. 7: p. 6]. In the past, this wasn't a problem. U.S. Government R&D used to be the major force driving technological innovation in the world and DOD procurement typically created a pull for private sector R&D. This is not the case today. [Ref. 15]

Commercial developments in many areas such as advanced computing, electronics, communications and medical research have far outpaced DOD's developments and are driven by business market forces rather than military need. [Ref. 10: p. 16] Declining budgets and dramatic changes in the characterization and makeup of the Defense Technology Industrial Base have forced DOD to rely more heavily on commercial industry during weapon systems development. Yet, many of the commercial industry businesses that hold the world's most advanced technology do not currently do business with the Federal Government. DOD's Director of Defense Procurement, Deidre Lee, recently commented:

Many firms that are the leaders in developing cutting edge technologies are currently unwilling to do business with DOD. DOD needs the best technological solutions and is adversely affected when these firms will not do business with DOD. [Ref. 28]

Technology and Procurement Policy Subcommittee Chairman Tom Davis noted that the Government's share of U.S. R&D spending dwindled from two-thirds to one-third from 1960 to 1999.

At the same that Government is no longer driving technological innovation, many commercial firms that invest billions of dollars in R&D every year are refusing to do business with the Government. This has serious implications for the well being of the United States. The real loss from the non-

participation from leading commercial R&D firms in the Government programs is the loss of alternatives, the loss of ideas and the loss of competitive solutions. [Ref. 29]

The focus of DOD's current regulations and policies regarding Section 845 OTA is aimed specifically at addressing this problem, attracting non-traditional companies to the DOD acquisition market [Ref. 4: Section C1]. In fact, the most current OT for Prototype Project legislation, Section 803, explicitly states that the first criterion DOD must meet before using Section 845 OTA is that there has to be at least one non-traditional supplier participating to a significant extent in the prototype project. [Ref. 4, Introduction] DOD believes that by using this special acquisition authority, they will be able to attract to the Federal acquisition market high-tech commercial R&D firms who were previously unwilling to conduct business with the Government (e.g., non-traditional suppliers). Simply put, DOD believes that Section 845 OTA will allow them to tap into the R&D being accomplished by non-traditional companies and thus, pursue commercial solutions to defense requirements [Ref. 4: Section C1].

This chapter will examine the issues surrounding DOD's efforts to attract non-traditional companies to do business with them. This chapter begins with a look at common barriers that prevent commercial companies from pursuing business in Government acquisition markets. Secondly, the researcher will highlight trends in DOD and commercial industry R&D and technology, which consequently provide the background for a discussion regarding the importance of DOD's ability to gain greater access to commercial industry's R&D and technology efforts. In closing, this chapter will present various elements of Section 845 OT arrangements.

B. BARRIERS TO ATTRACTING NON-TRADITIONAL COMPANIES

Clearly, DOD finds itself in a unique business situation today. The age-old pattern of defense technology "spinning off" into the commercial sector has been replaced with a pattern of commercial technology "spinning on" to military applications. Additionally, DOD expenditures on technology and R&D represent a much smaller percentage of total U.S expenditures in this category [Ref. 7: p. 6]. As a consequence,

many times DOD finds itself having to buy from companies that either do not want or need to do business with them. Research has been devoted in the past to the study of why companies are not willing to conduct business with DOD [Ref. 30: p. 1]. Many of these studies have concluded that it is the Government's buying practices that form major barriers to non-traditional companies doing business in the defense market. But, what exactly are those barriers and what is it about them that keep companies from wanting to conduct business with DOD?

DOD's concern that there might exist a significant number of commercial companies unwilling to participate in the Defense acquisition market is actually not just a Post Cold War concern. Even prior to the end of the Cold War, research was being conducted within DOD to determine both if this was the case or not, and if so, what were the reasons [Ref. 31]. It's interesting to note that even in the mid to late 1980's, well before the push for Government acquisition reform, DOD recognized the importance of cultivating business with commercial companies other than the traditional large defense prime contractors. Additionally, DOD acquisition officials were becoming increasingly more aware of the fact that the procurement system's complexity, red tape, bureaucratic inaction and tendency to encourage micromanagement of contractor's actions might be driving companies away from doing business with them, regardless of the amount of money DOD was spending in the private sector. [Ref. 31]

1. Barriers - Pre Cold War

A 1987 study conducted by Dr. David Lamm of the Naval Postgraduate School, Monterey, CA, surveyed over 1,300 commercial firms from selected industries in an attempt to determine the nature and extent of company refusal to participate in DOD business. [Ref. 31: p. 45] Survey responses showed that burdensome paperwork and Government bidding methods were the two major reasons why companies refused defense business. In fact, close to 70 percent of the respondents to his survey listed burdensome paperwork as one of their primary complaints related to dealing with the Government. One company in particular stated in their survey response that one of their proposals to a Government solicitation took three weeks to prepare and included 100

pages of paperwork, whereas a proposal to a similar commercial job took only three hours to prepare and 10 pages of paperwork. [Ref. 31: pp. 48-49] With respect to Government bidding methods, “most focused on the extensive bid package involving unreadable specifications, unrealistic standards and unobtainable standards.” [Ref. 31: p. 50] Many of the complaints that survey respondents had regarding burdensome paperwork and bidding methods pertained to problems that they encountered prior to contract award. [Ref. 31: p. 50]

Dr. Lamm’s study also identified several other reasons why companies refused defense business. In addition to the two most popular responses cited above, inflexible procurement policies and more attractive commercial ventures were identified as being the third and fourth most popular reasons. [Ref. 31: p. 54] Of the 427 respondents in the survey, slightly more than 20 percent stated that they would not seek DOD business in the future and an additional 30 percent were dissatisfied enough with the market that they voiced their complaints in the survey, even though they were not planning on refusing to do future business with DOD. [Ref. 31: p. 53] This fact alone leads to a very important point regarding the circumstances that might cause a firm to refuse defense business.

Companies refusing DOD business have essentially no difference in their reasons than companies that are in defense business but are dissatisfied with the system. The implication is that a fine line separates the “out” companies from the “in” companies, and that the latter may join the former with just a little more dissatisfaction. [Ref. 31: p. 54]

2. Barriers - Post Cold War

Many dramatic changes have occurred in the acquisition environment since Dr. Lamm’s 1987 study. A major re-structuring of the Defense Technology and Industrial Base, several acquisition reform initiatives and post Cold War reductions in defense spending have no doubt affected private industry’s attitude towards doing business with the Government. The question now becomes, are companies still refusing defense business now as they were in 1987? And if so, is it for the same reasons identified in Dr. Lamm’s study?

In an attempt to answer these questions, Susan Randall, a Master’s student at the Naval Postgraduate School, Monterey, CA, conducted a follow-on study in 1997 in the

same subject area. [Ref. 30] The purpose of her study was to identify in the more current acquisition environment, the extent to which companies refuse defense business and the reasons why they are refusing. Using a very similar methodology to Dr. Lamm's, Susan Randall surveyed 1300 companies sprinkled across various industries. [Ref. 30: p. v]

One of the major tenets of Government acquisition reform in the mid 1990's was the Federal Acquisition Streamlining Act (FASA). FASA is generally credited as being the landmark acquisition reform legislation of this period and was designed to transform the Government procurement process into a simplified, more efficient and accessible system. [Ref. 30: p. 16] The need for this transformation is obvious, considering the results of Dr. Lamm's Study.

Prior to FASA's passage many commercial companies were reluctant to do business with the Federal Government because of the costs and risk associated with the myriad of cost accounting rules, socioeconomic statutes, and Government-peculiar inspection systems that applied only to Government contracts. [Ref. 30: p. 19]

FASA and similar acquisition reform initiatives of the time were developed specifically to address these concerns. For example, FASA exempted the Government's procurement of commercial items from many of the burdensome reporting and record keeping requirements associated with non-commercial contracts. Secondly, FASA exempted DOD from requiring cost or pricing data during the negotiation of commercial item procurements. [Ref. 30: pp. 19-20]

Intuitively, one would expect that acquisition reform efforts such as FASA would have resulted in a much smaller number of companies refusing to do business with the Government today (as compared to the 1980's). However, Susan Randall's study indicates that this is not true. [Ref. 30] First of all, her study concluded that there was a significantly greater proportion of companies refusing to participate in DOD business in 1997 as compared to 1987. The statistics in her research revealed that 42 percent of her respondents were either currently conducting business with DOD and intending to get out of the business or were not in business with DOD and had no intention of entering the market. This statistic is double the amount reported in the 1987 study. [Ref. 30: p. 133]

Additionally, the Randall study concluded that the principal reasons why companies refuse to conduct business with DOD in 1997 had not significantly changed from the reasons identified in the 1987 study. [Ref. 30: p. 135] More specifically, this study concluded that burdensome paperwork, Government bidding methods, inflexible procurement policies, low profitability and more attractive commercial ventures topped the respondents' list as the top five reasons why they refused DOD business. [Ref. 30: p. 135]

Although, the Government has initiated several improvements to the Federal procurement system over the last ten years (primarily through FASA, FARA and ITMRA), the researcher concludes that these changes have not significantly impacted companies' attitudes towards Defense business. [Ref. 30: p. 136]

Randall's 1997 study also solicited comments from the survey respondents aimed at determining if there were specific improvements that could be made that would encourage those who were currently refusing to do business to change their mind. [Ref. 30: p. 137] Accordingly, the companies stated that if the following improvements were made to the DOD acquisition system, they would enter the market:

- Reduce the use of military specifications.
- Eliminate non-relevant paperwork in bidding requirements.
- Ensure timely payments to the contractor.
- Reduce the amount of paperwork in the overall procurement process. [Ref. 30: p. 137]

3. Barriers in the Defense Research and Development Market

As previously mentioned, OTA was developed with the intent of providing DOD the flexibility to negotiate business relationship terms and agreements without the restrictions imposed by traditional FAR clauses. DOD officials and legislators envisioned Section 845 OTA being used to allow firms to conduct business with the Government without changing any of their current practices or processes. It is commonly understood that companies organize to do business in either the defense sector or the commercial sector, but rarely do both under one administrative roof. [Ref. 7: p. 34]

“Companies that do business in both sectors typically have separate divisions that are organized differently and almost never share staff, production and research facilities, data, and accounting procedures.” [Ref. 7: p. 34] Commercial divisions respond to market conditions, whereas the Defense divisions typically respond to military programs and budget cycles. Maintaining such dramatically separate operations is extremely costly and is only done when it makes good business sense. [Ref. 7: p. 34]

Traditional DOD contracts usually regulate profit in some respect, even when it's a cost-type contract involving heavy R&D. In contrast, most high-technology private industry companies recover their investment in R&D through large profits, then reinvest those profits in the next generation product. [Ref. 7: p. 34] Traditional defense contractors, on the other hand, are able to survive on smaller profits because their R&D costs are typically recovered through terms of the contract. However, in these cases the Government usually owns the data rights so that they can make the data package available to future bidders in an effort to promote future competition. Commercial companies that invest heavily in R&D do not subscribe to this process because they see it as offering their trade secrets to their competition. [Ref. 7: p. 34]

As it stands, the intellectual property rights clauses found in traditional FAR type contracts are the Government regulation that companies most frequently cite as their reason for refusing Government R&D contracts. [Ref. 32: p. 18]

Many technology businesses are reluctant to conduct research and development with the Government because of uncertainties about who would receive the intellectual property that results from the ventures. [Ref. 29]

The Government's rights to hold patents and intellectual property (IP) represent the major barrier preventing commercial companies from performing R&D for the Government. Many of the world's leading high technology companies bypass DOD business because traditional DOD contracts prohibit them from using their innovations in future commercial products. [Ref. 28]

The concept of IP is a fundamental concept in the world's free market societies. “A company's interest in protecting its IP from uncompensated exploitation is as important as a farmer's interest in protecting his or her seed corn.” [Ref. 33: p. iii] In the

DOD acquisition arena, IP typically refers to patents, copyrights, trademarks and trade secrets. [Ref. 33: p. 1] The Bayh-Dole Act is the guiding regulation regarding IP in Government contracts and was originally designed to facilitate the commercialization and public availability of inventions. [Ref. 6: p. 30] While it is DOD's policy (when using traditional FAR type contracts) to acquire only the IP necessary to satisfy DOD needs, its decision with respect to how to handle IP rights really comes down to who is funding the R&D. For example, DOD usually obtains unlimited rights when IP was developed exclusively with DOD funds, Government purpose rights when the IP was created with mixed funding, and limited rights when the IP was developed exclusively at the private firm's own expense. [Ref. 6: p. 30]

One of the guiding principles behind Section 845 OTA is the Government's desire to implement best commercial business practices. As such, the standard IP requirements normally imposed by the Bayh-Dole Act do not apply to OT agreements, meaning that Agreement Officers are free to negotiate IP terms and conditions different from those found in FAR type contracts. [Ref. 4: Section C2.3] IP issues tend to be very complex. Therefore, there is no single answer that can be applied to every situation regarding the question of what's the most appropriate IP strategy.

In the final analysis, flexibility will be the hallmark of future Government/industry R&D agreements. It is in the Government's best interest to understand, and when possible and appropriate, accommodate industry's concerns in protecting its IP. Only in this way will the Government be able to tap into the billions of dollars worth of R&D and cutting edge technologies available in commercial companies that cannot or will not do business with the Government under the current regulatory circumstances. [Ref. 22]

C. TECHNOLOGY ISSUES

Huge defense spending cuts in the United States from FY 1986 up until FY 1998 have directly lead to the re-structuring of the Defense Technology and Industrial Base (DTIB) and the nation's industrial base. However, it's not simply the change in size or configuration of these bases that drives DOD's need to attract to the defense market non-traditional commercial firms that currently only support the national industrial base.

Rather, it is the drastic changes over the last decade in the amount of R&D spending in each base.

1. Federal Research and Development

In order to properly discuss trends in Federal R&D, it's important to first understand the different categories of Federal R&D spending. At the Federal Government level, total Federal R&D can be broken down into two categories: defense and non-defense. [Ref. 35] The real reason behind such a simplistic breakdown is that defense R&D spending comprises such a large percentage of total Federal R&D spending that most other agencies' individual spending seems inconsequential in comparison. In FY 1999, defense R&D comprised 48 percent of total Federal R&D. [Ref. 34]

Defense R&D spending is mostly captured within DOD's Research, Development, Test and Evaluation (RDT&E) program, which is one of the major elements of DOD's total budget. [Ref. 36: p. 1] The RDT&E budget is then sub-divided into seven separate categories (designated as Program Elements 6.1 through 6.7): basic research (6.1), applied research (6.2), advanced technology development (6.3), demonstration and validation (6.4), engineering manufacturing development (6.5), management support (6.6), and operational systems development (6.7). [Ref. 36: p. 1] "Funding for the first two categories (6.1 and 6.2) constitute what is called DOD's Technology Base program and is often referred to as the 'seed corn'." [Ref. 36: p. 2] The Technology Base combined with 6.3 activities make up DOD's Science and Technology Program (S&T). However, the remaining categories (6.4 through 6.7) are where the largest percentage of the RDT&E budget goes. [Ref. 36: p. 3]

FY 2001 marks an all time high (in inflation adjusted terms) in total Federal R&D spending over the last quarter century. [Ref. 35: p. 1] In 1976, the Government spent less than \$60 billion (in today's adjusted dollars) as compared to the \$85 billion budgeted for FY 2001. While one may guess that there was a smooth upward linear path between these two points, that is far from the case. The relative split between defense and non-defense R&D spending has also changed over the years. The following graph depicts the changes in total Federal R&D spending and the split between defense and non-defense categories over the last 25 years:

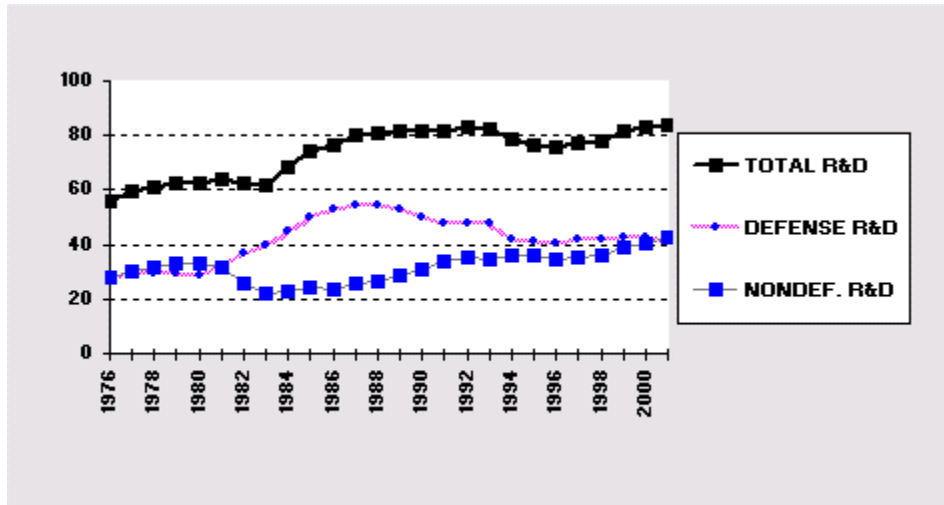


Figure 6: Trends in Federal R&D Spending (in billions of constant FY 2000 dollars), from FY 1976-2001 [Ref. 35]

As evidenced from the graph above, defense specific R&D spending (a part of total DOD RDT&E program spending) has changed over the years. An obvious anomaly in the spending trend is the peak that occurred in the mid 1980's. From FY 1980 to its peak in FY 87, defense R&D nearly doubled in real terms as the U.S. embarked upon a substantial increase in all forms of defense spending. By FY 87, defense R&D was two-thirds of total Federal R&D spending. [Ref. 35: p. 2]

Even though total real defense R&D spending increased since the mid 70's, real RDT&E funding from FY 1988 through FY 1998 remained relatively level. During this same period (FY 88 – FY 98), DOD spent an average of \$36 billion a year on RDT&E, of which over 80 percent has gone to the development of specific military systems (activities 6.4 through 6.7). The remaining 20 percent funded the Technology Base programs. [Ref. 36: Summary] If inflation is taken into consideration, DOD's RDT&E spending declined from a FY 1987 peak every year until FY 1998. Interestingly, much of the decline is attributed primarily to the activities associated with developing specific weapon systems. More specifically, much of the decline took place in funding for 6.4, 6.5 and 6.7 activities, which are activities that support a formal acquisition program. [Ref. 36: p. 3] In contrast, the Technology Base program (a.k.a. DOD's "seed corn") has for the most part kept up with inflation. [Ref. 36: Summary] In the final analysis, FY

2001 total defense R&D spending in real terms is one-third below the peak funding levels of the late 1980's. [Ref. 35: p. 2]

Given the fact that real defense R&D spending had steadily declined from FY 1988 – FY 1998, it's not difficult to imagine that the same trend has occurred for defense R&D spending within the few remaining defense companies. Traditionally, there are three sources of R&D funds for defense industry companies: 1) DOD contract R&D for development programs; 2) Company-sponsored R&D; and 3) Independent Research and Development (IRAD) paid for by the Government but spent at the discretion of the contractor. [Ref. 37: p. 8] According to Booz–Allen & Hamilton's 2000 study on the U.S. Defense Industry, the first two categories have declined steadily from FY 1988 through FY 1998. The third category, IRAD, has increased, but because it has been used more for the development of specific deliverables, rather than long term independent R&D. [Ref. 37: p. 9]

2. Industry Research and Development

Times have changed significantly since 1976, when a professional science organization christened the first edition of their association magazine with the following opening line: “The Federal Government holds most of the high cards which determine the thrust and priorities of scientific research and development effort in the United States.” [Ref. 35: pp. 6-7] Since then, a dramatic shift in the composition of total national R&D spending has occurred. In 1980, private industry first exceeded Federal Government spending on R&D. Ever since then (with the exception of DOD's peak spending level in 1987), Federal R&D spending has lagged in comparison with private industry's efforts. In 1999, private industry accounted for 68.5 percent of total U.S. R&D and the Federal share has continued to decline. [Ref. 35: p. 6] Table 2 highlights the growth of industry's share of total national R&D spending over the last several decades.

	1970	1980	1990	2000	Percent Share of Total		
	Actual	Actual	Actual	Prelim.	1970	1980	2000
Current Dollars							
Federal	14,984	30,035	61,669	69,627	57.0%	47.5%	26.3%
Industry	10,449	30,929	83,208	181,040	39.8%	48.9%	68.4%
Colleges and Univs.	259	920	3,187	5,969	1.0%	1.5%	2.3%
State/Local	237	519	1,399	2,197	0.9%	0.8%	0.9%
Nonprofits	343	871	2,589	5,789	1.3%	1.4%	2.2%
TOTAL	26,271	63,273	152,051	264,622	100.0%	100.0%	100.0%

Table 2: National Funds for R&D by Source of Funds (in millions) [Ref. 35: p. 6]

Given that the technological explosions occurring in private industry are driving the “new global economy,” many experts believe that the current trends discussed above will continue well into the next century.

The near-term economic competitiveness of U.S. firms, progress on today’s technological frontiers, and the overall health of the increasingly technology-based U.S. economy are today far more dependent on U.S. industrial firms’ R&D efforts than could have been imagined 25 years ago, and the overall health of the U.S. R&D enterprise is far more dependent on private industry. [Ref. 35: p. 7]

3. The Need for Accessing Non-Traditional Research and Development

The United States’ national security rests in large part on the ability of the Armed Forces to maintain world wide technological superiority. This was true in the past, and regardless of the specific strategy being followed, will remain the case in the future. In this post Cold War era, “the Department of Defense and a wide array of scholars, analysts, and visionaries outside the military assert that the U.S. military is on the threshold of a Revolution in Military Affairs.” [Ref. 18: p.1] DOD’s RMA vision for the 21st century consists of a force made up of warfighters that are fast, lean, mobile and prepared for battle with total battlespace situational awareness and information assurance. [Ref. 38: p. 2]

Much of the discussions surrounding DOD’s new visions and strategies center on the exploitation of superior technology. [Ref. 18: p. 1] In order to successfully carry out

these new visions and strategies, DOD must ensure that they have access to and benefit fully from the most cutting edge technologies. In times past, DOD developed their own cutting edge technology for use in military products. But also in times past, DOD had the money to finance this development and used a robust defense unique industrial base to carry it out. This is not possible today. [Ref. 9]

Defense budget reductions have forced an increasing emphasis on affordability as a leading investment factor in DOD's R&D programs. [Ref. 15: p. 7] The simple fact is that DOD will not be able to afford the weapon systems they need to successfully carry out the RMA's visions and strategies unless their cost of development is significantly reduced. Since the end of the Cold War, DOD has dealt with declining budgets by concentrating on force readiness rather than modernization. It's apparent though, that the success of the RMA is almost totally dependent on DOD's ability to modernize their force. [Ref. 15: p. 7]

Modernizing the Armed Forces no doubt requires significant R&D efforts. However, budget pressures have also squeezed military R&D spending. Data presented earlier show that military R&D spending is currently down 30 percent from its inflation-adjusted peak in the late 1980's. [Ref. 33: Foreword] To make matters even tougher, DOD's revised acquisition process spells out specific goals such as dramatically reducing weapon system total ownership costs and rapidly deploying advanced technology products to the warfighters. In order to achieve the much needed force modernization and accomplish the acquisition system's new goals within a reduced budget environment, DOD will need access to technology that is both timely and affordable. [Ref. 15: p. 7]

In addition to the affordability problem, accessing the technology that DOD needs for future survival is not as simple as acquiring it more quickly from in house labs or providing better incentives for defense contractors to come up with it. At the same time that defense R&D spending was declining, private industry spending on R&D soared, so much so that it accounts for two-thirds of the nation's total R&D spending. [Ref. 33: p. iii]

DOD historically pursued competition to assure efficiency, affordability and innovation in the DTIB. Over the last several years, however, the DTIB has undergone a

fundamental change. The DTIB transition brought about by the end of the Cold War and complicated by the explosion of the “new economy” means that traditional defense companies are now competing for resources (human, financial and technological) with the “new economy” companies. [Ref. 39] The end result is that a number of leading technology companies have exited the defense market and the companies remaining are competing for fewer new major programs. The irony about this is that the technologies so critical to achieving future advances in military capability are being increasingly developed in the private sector. The truth is that “today’s commercial world is leading the process of innovation and efficiency in many areas critical to defense in the next century.” [Ref. 10: p. 24]

Many believe that the hard reality facing DOD is that the two previous industrial bases (DTIB and national industrial base) have already merged, yet DOD’s business practices have not kept pace with this fundamental shift. [Ref. 40: p. 6] Despite significant efforts over the last decade on the part of Government and DOD officials to reform the acquisition system, there still remains a strong belief that there are significant barriers to preventing commercial companies from doing business with DOD. [Ref. 10: p. 24] The bottom line is that in the future, DOD may have to buy advanced technology from commercial companies that do not need or even want its business.

Given the situation described above, it is clear that DOD must find new ways to solve its problems. Declining budgets and R&D spending limit DOD’s ability to sustain a cutting edge DTIB (with the exception of a few military specific areas). Additionally, many technologies critical to future warfighting are being developed and fielded from commercial companies operating in non-defense markets. Better, faster, cheaper are the latest mantras of DOD acquisition. There is no way DOD will be able to solve its problems without tapping into the superior technology available in the commercial world. Therefore, it is extremely critical that DOD have access to the R&D resources and creative forces of the U.S. industrial base, or more specifically, to the host of leading edge companies that have never done business with them in the past.

4. Elements of Other Transaction Agreements

OTs are most easily defined by describing what they are not. OTs are not a contract, grant or cooperative agreement. Consequently, they are much simpler and shorter than a traditional procurement contract. Of course, the intended point of this legislative freedom is that it enables Agreement Officers to design the best agreement for the situation. Essentially what this means is that Agreement Officers start with a blank sheet of paper when they craft an OT. But, this also means that there is no one format for such agreements. [Ref. 32: p. 25] Given this, one might ask if there are any common elements of OT arrangements and if so, how might they encourage non-traditional companies to pursue defense business?

The Director of Defense Procurement (DDP) has cognizance for overseeing DOD's implementation of Section 845 OTs. [Ref. 32: p. 28] As such, DDP acknowledges the unstructured environment that Agreement Officers operate in while crafting OTs, but offers "things to consider" in the DUSD (AT&L) "OT Guide for Prototype Projects." [Ref. 4] A recent General Accounting Office (GAO) report analyzed Section 845 OT agreements and determined that in general DOD's Section 845 agreements addressed many of the areas typically governed by standard FAR type contract provisions. [Ref. 6: p. 13] Perhaps this is due to the fact that the "OT Guide for Prototype Projects" list of things Agreement Officers should consider includes traditional contract topics such as price reasonableness, allowable costs, audit, termination and dispute processes, intellectual property rights, etc. [Ref. 4]

Even though many of DOD's Section 845 agreements addressed areas typically governed by traditional FAR type contract provisions, they did not address them in traditional ways. Part of GAO's tasking in its recent study of DOD's use of Section 845 OTs was to identify how DOD tailored these agreements to address issues normally governed by standard contract provisions. [Ref. 6: p. 1] What they found is that regardless of the type of contractor (i.e., traditional vs. non-traditional), the agreement's value, or the recipient's contribution share of financial assets, DOD's Section 845 agreements all had several common themes, as follows:

- They relied on means other than certified cost and pricing data to establish a fair and reasonable price for the effort undertaken.
- They allowed contractors to use Generally Accepted Accounting Principles (GAAP) rather than Government cost accounting standards.
- They limited the Government's audit rights, generally by omitting: 1) the requirement that the clause be included in subcontracts, and 2) the requirement that provided GAO access to the prime and subcontractor books and records.
- They paid contractors a specified amount based on the accomplishment of agreed to technical milestones, rather than on the basis of incurred costs.
- They did not provide DOD a right to terminate an effort for default by the contractor.
- They authorized the use of an alternative dispute resolution process that provided for a more streamlined and shortened process. [Ref. 6: p. 13]

In addition to the above list, many of the Section 845 agreements that GAO looked at also provided considerable flexibility to the prime contractors regarding their management of subcontractor issues. [Ref. 6: p. 13] For example, a large number of the agreements completely waived the requirement for prime contractors to select their subs competitively and only two of the agreements that they analyzed required the contractor to notify the Government of their intent to award subcontracts when they exceeded a pre-determined dollar threshold. [Ref. 6: p. 13] At first glance, it appears that the key elements of DOD's Section 845 agreements could address many of the previously identified common barriers to attracting non-traditional companies to the defense market. Now the question becomes, how well did they?

D. SUMMARY

DOD is operating in an environment today that is almost 180 degrees out from ten years ago. Today, we aren't completely sure who our adversaries are, defense budgets and military R&D spending experienced great decline from FY 1988 until FY 1998, the DTIB has essentially merged with the national industrial base and DOD reform efforts have started but are occurring at a much slower pace than the rapid globalization being fueled by private industry technology advancements.

In order to ensure our nation's security and remain globally dominant in this new era, DOD must have access to the most superior technology on the planet. As opposed to a decade ago when DOD funded and owned the most cutting edge technology, today commercial companies operating in commercial markets hold much of the world's superior technology. DOD simply does not have the resources today to fund comparable technology themselves. Consequently, DOD is forced to rely on these commercial markets to satisfy its demand for the rapid insertion of superior technology into weapon systems at an affordable price. Yet, studies suggest that significant barriers exist that prevent commercial industry from seeking business with the Government. Therein lies the dilemma; in order to survive, DOD must tap into the technology held by commercial firms that neither need nor want their business.

Section 845 agreements were developed for the primary purpose of attracting non-traditional companies to do business with DOD. While current Section 845 guidance provides Agreement Officers with a framework for crafting OTs, it does not specifically delineate a format or require specific traditional contract clauses to be addressed. Interestingly enough, many of DOD's Section 845 agreements contained common themes with respect to their method for addressing traditional contract provisions. This chapter examined the major issues surrounding DOD's need to attract non-traditional companies to the defense market and also how Section 845 agreements have been structured to address these issues. Understanding the issues provides the critical background necessary to properly examine DOD's use of Section 845 OTA with respect to its primary legislative intent – to attract non-traditional firms to the defense market. Chapter IV details a survey conducted of non-traditional companies that entered into their first business relationship with DOD using an OT as the vehicle and presents the survey results.

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IV. SURVEY DATA PRESENTATION

A. INTRODUCTION

DOD's budget and R&D environments have changed dramatically over the past decade. As Chapter III described, DOD is no longer in the driver's seat when it comes to R&D spending, yet it still needs access to the world's most cutting edge technology advances in order to successfully carry out its future strategies and missions. Today, much of the nation's research is being done in private industry, which means that it is being done outside of DOD's span of control. Consequently, DOD faces a situation in which it must compete with other organizations and companies in order to obtain the R&D and technology that it needs.

For a number of years, both DOD and Government officials have expressed concerns that significant barriers exist which inhibit DOD's ability to obtain and take advantage of the technological advances being made by the private sector. DOD studies have been conducted throughout the last two decades in an effort to determine the nature and extent of these barriers. OTA was developed as a method to overcome these barriers, and thus allow the Government to gain access to private sector technological advances.

Chapter II discussed how OTA legislation has evolved significantly since its inception. It was also pointed out that the most recent legislation, passed in October 2000, now requires Section 845 agreements to include at least one non-traditional company participating to a significant extent in the DOD project; and if not, at least one third of the total cost of the project should be provided by parties other than the Federal Government. So clearly, the primary legislative intent of Section 845 OTA today is to give DOD a tool to attract the non-traditional companies with the most cutting edge technology to the defense market.

Ever since they were given Section 845 authority (FY 1994), DOD and DARPA have been periodically required to justify its benefits to lawmakers, primarily through an annual report to Congress on the use of OTs. Consequently, there already exists much published data on DOD and DARPA's perceived benefits to using Section 845 OTs, including which specific barriers they believe are being overcome as a result of using

OTs. Despite the requirement for DOD to submit an annual report to Congress on its usage of OTs, there did not exist until FY 2001 any requirement for DOD to track specific OT performance metrics. Rather, Agreement Officers were required to provide subjective inputs as to how they felt the OT contributed to a broadening of the DTIB or fostered new relationships and practices that supported the national security of the U.S. [Ref. 41] Agreement Officers were required to provide some specific quantifiable data, but only in the form of cost-sharing figures between Federal and non-Federal participants. [Ref. 41] Thus substantial data exists on how the Government feels Section 845 OTs are performing with respect to their legislative intent; however, much of it is subjective in nature.

Chapter IV examines DOD's use of Section 845 OTs during the period from FY 1994 through FY 2000. This chapter discusses a survey the researcher conducted with non-traditional companies that did business with the Government for the first time (from FY 94 – 00) using a Section 845 OT. The survey results and data are then presented. Eventually, these results will be analyzed by comparing the non-traditional companies' views of the Section 845 OT's ability to live up to its legislative intent versus the Government's perception of how well they are performing.

B. SURVEY BACKGROUND

1. Methodology

A survey was conducted of companies that entered into agreements with DOD during the period from FY 1994 to FY 2000 using Section 845 OTs as the vehicle for their agreement. Additionally, all of the companies surveyed were classified as non-traditional companies (according to the Office of Secretary of Defense's (OSD) definition) at the time that they entered into the OT agreement. As previously mentioned, OSD defines a non-traditional company in the January 2001 *Other Transactions Guide for Prototype Projects* as follows:

A business unit that has not, for a period of at least one year prior to the date of the OT agreement, entered into or performed on (1) any procurement contract that is subject to full coverage under the cost accounting standards prescribed pursuant to Section 26 of the Office of Federal Procurement Policy Act (41 U.S.C. 422) and the regulations implementing such section; or

(2) any other procurement contract in excess of \$500,000 to carry out prototype projects or to perform basic, applied, or advanced research projects for a Federal agency. [Ref. 4: DL1.12]

The overall purpose of the survey was to examine DOD's use of Section 845 OTs according to the authority's primary legislative intent, which is to provide a method for DOD to attract non-traditional "cutting edge" companies to the defense market and after they are attracted, allow DOD to tap into their technology resources. With that in mind, the survey was developed to address the following issues:

- Was it the OT that attracted these non-traditional companies to do business with DOD? Or, would they have done business with DOD at the time regardless of whether an OT was used or not?
- Were the non-traditional companies that DOD did in fact conduct business with using OTs the kind that the legislation was designed for them to attract? And if yes, how much of them did DOD attract (meaning, what percentage of their R&D and technology resources did the agreement give DOD access to?)?

The researcher obtained the data on DOD and DARPA Section 845 OTs awarded between FY 1994 and FY 2000 from two sources; (1) published DOD Annual Reports on Cooperative Agreements and Other Transactions Entered into Under 10 USC 2371, and (2) a database maintained by Ms. Teresa Brooks at DUSD (AT&L). Using these two sources, the researcher selected the companies that had both been awarded a Section 845 OT and were classified as non-traditional at the time of the award and targeted the survey to these companies.

It is important to point out that this thesis is not intended to determine DOD's success rate of using Section 845 OTs to attract non-traditional companies. Such an analysis would involve surveying commercial companies that had never done business with the Government with the intent of determining how OTs could be used to attract them. The researcher took DOD's success rate of attracting non-traditional companies as a given and therefore, targeted the surveys to the already "fixed pool" of non-traditional companies that had entered into a business relationship with DOD using an OT. Consequently, this survey focused exclusively on these relationships and was aimed at

determining whether the OTs, as the vehicle for these relationships, were living up to their authority's intent

The survey was administered electronically via the Naval Postgraduate School's (NPS) Office of Strategic Planning, Educational Assessment and Institutional Research (SPEAR). The survey questionnaire was prepared using the "SurveySaid" online survey software and distributed to non-traditional companies via a link contained within an introductory and explanatory e-mail. Non-traditional company e-mail addresses were found using worldwide web searches and/or through contact with Agreement Officers. In an effort to encourage frank participation, survey respondents were promised anonymity. Consequently, aside from the general demographic questions, there is no way to specifically link survey response data to a particular company. Survey respondents were given one month to complete their survey and were directed to return it electronically by clicking a "submit" button at the end of the survey. Survey response data were accumulated centrally within the SPEAR office and then processed by the researcher using the "SurveySaid" software.

2. Pool

DOD and DARPA combined administered 245 new Section 845 OTs from FY 1994 through FY 2000. [Ref. 42] Figure 4, Chapter II, provided the specific breakdown of the number of new Section 845 OTs administered per fiscal year during this same period. Of note, DOD and DARPA did issue additional Section 845 OTs during this period (i.e., above and beyond the 245 figure). However, they were for modifications to existing OT arrangements and this thesis focused exclusively on new awards.

According to DUSD's (AT&L) Section 845 OT database, 85 (35 percent) of the 245 new OT agreements involved non-traditional participants. [Ref. 42] These 85 new OT agreements that involved non-traditional company participants were the "fixed pool" of companies to which the researcher targeted the surveys. Figure 7, taken from a DUSD (AT&L) slide-show presentation, provides a specific breakdown according to the percentage of new agreements per fiscal year that involved non-traditional participants.

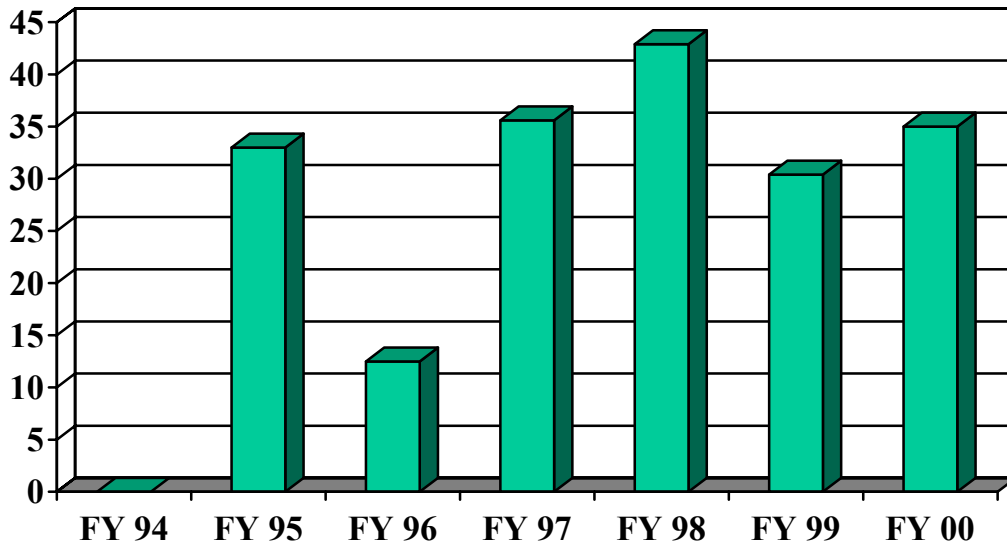


Figure 7: Percentage of new OTs that include non-traditional company participants, from FY 94 – FY 00, [Ref. 23]

The numbers 245 and 85 represent the number of total agreements and number of agreements involving non-traditional participants, not the total number of participants and non-traditional participants respectively involved in those agreements. Much like a traditional contract arrangement, each of the OT agreements contained various combinations and numbers of prime and subcontractor team participants.

It is important to further breakdown the agreements by the numbers of non-traditional participants involved and the level (e.g., prime or subcontractor) at which they resided. On a macro level, the 245 new OT agreements involved 475 total participants (which includes both prime level and subcontractor level participants). Of these 475 participants, 119 were classified as non-traditional companies. These 119 non-traditional participants also represent the “fixed pool” of companies that the researcher targeted. A further breakdown of the 119 non-traditional participants into the prime contractor category reveals that 30 (35 percent) out of the 85 agreements involved non-traditional prime companies. Given that each OT only had one prime contractor, this means that 30 out of the 119 (or 25 percent) non-traditional participants were prime contractors and the remaining 89 non-traditional companies were acting as sub-contractors.

3. Submission and Response

The survey was sent to a total of 76 companies, which represents 64 percent of the 119 total non-traditional participants. The researcher chose the 76 companies based purely on the availability of company point of contact information (e.g., phone number and e-mail addresses). Considering that a large percentage of the agreements dated back several years (fiscal years 95, 96, 97 and 98), the researcher discovered many situations where companies either were bought out by other companies or failed to exist any more. The 76 companies targeted, however, did represent a good mix of prime and subcontractor companies. Of the 76 non-traditional companies that were sent surveys, 22 were prime contractors and 54 were subcontractors, representing 73 percent and 61 percent of the total non-traditional prime and sub-contractor companies respectively.

Of the 76 non-traditional companies solicited, six were returned within the one-month time constraint. This represents an 8 percent response rate. After the survey cutoff date, the researcher aggressively pursued communications with the Agreement Offices responsible for 17 of the most recent (e.g., FYs 99 and 00) OTs involving non-traditional prime participants in an attempt to gather more accurate company point of contact information (and thus, better target the surveys within the companies). As a result, one additional response was received and was included in the data analysis, bringing the total number of responses up to seven (and a 9 percent response rate).

C. SURVEY QUESTIONS AND RESULTS

1. Companies Attracted

Questions 1-7 served the purpose of acquiring demographic information regarding the responding companies. These questions were aimed at determining the companies' industry, primary products or services, annual sales volume, annual R&D budget, prime versus sub-contractor characterization, position relative to rest of industry with respect to the amount of DOD business conducted and history of conducting business with other Federal Government agencies. Aside from providing a method for categorizing the survey results, the demographic questions were developed to also help determine whether these non-traditional companies that DOD did conduct business with using an OT were in

fact the type that the Section 845 OT legislation had hoped they would attract (e.g., companies operating in exclusively commercial markets that invested heavily in technology and R&D).

Question 1 asked respondents to fill in their company’s primary product or service. All seven survey respondents answered this question and with the exception of two companies, responded with different answers. At first glance, it appears that products and services vary greatly, but all might involve advanced information technology. The answers to this question for all seven respondents are displayed in Table 3:

Respondent	Primary Product or Service
1	Image Processing Products and Service
2	Communications and Avionics Software
3	Training Software, Technical Services and Program Management
4	Advanced Modeling and Tactical Simulation
5	R&D, Manufacturing, Test and Launch of Inflated Space Structures
6	Mitigation of Radio Interference Products and Services
7	Communications and Avionics Software

Table 3: Companies’ Primary Product or Service [Developed by Researcher]

Question 2 asked the companies to identify their primary industry. All seven respondents answered this question and the results are displayed in Table 4.

Respondent	Primary Industry
1	Military – Department of Defense
2	Software
3	Professional Engineering Services
4	Information Technology and Engineering Services
5	Aerospace Industry
6	Communications Electronics
7	Software

Table 4: Companies' Primary Industry [Developed by Researcher]

It's interesting to note that Respondent 1 listed their primary industry as military/DOD, yet they were classified according to DUSD's (AT&L) definition as a non-traditional company. This could be for one of two reasons. First, the company might have been involved primarily in a non-DOD industry at the time they were awarded the OT, but subsequently accepted follow-on DOD work and therefore re-structured to move primarily into the DOD market. Another possibility is that they had primarily been a defense company, but for whatever reason had not conducted DOD business for the year prior to the OT arrangement, and thus qualified as a non-traditional company. Without further information, it would be impossible to determine which of the two categories they fit into. Regardless, they were classified as non-traditional at the time they were awarded the OT and will be considered as such for the purposes of this thesis.

Question 3 asked the companies to identify their current annual sales volume. The researcher subdivided respondents into various categories of business sizes according to their annual sales volume. Respondents were asked to characterize themselves in this respect by selecting one of the following five graduated categories that best matched their company's current annual sales volume:

- Under \$1,000,000

- \$1,000,000 - \$5,000,000
- \$5,000,000 - \$50,000,000
- \$50,000,000 - \$100,000,000
- Over \$100,000,000

All seven of the respondents answered Question 3 and the results are displayed in Figure 8.

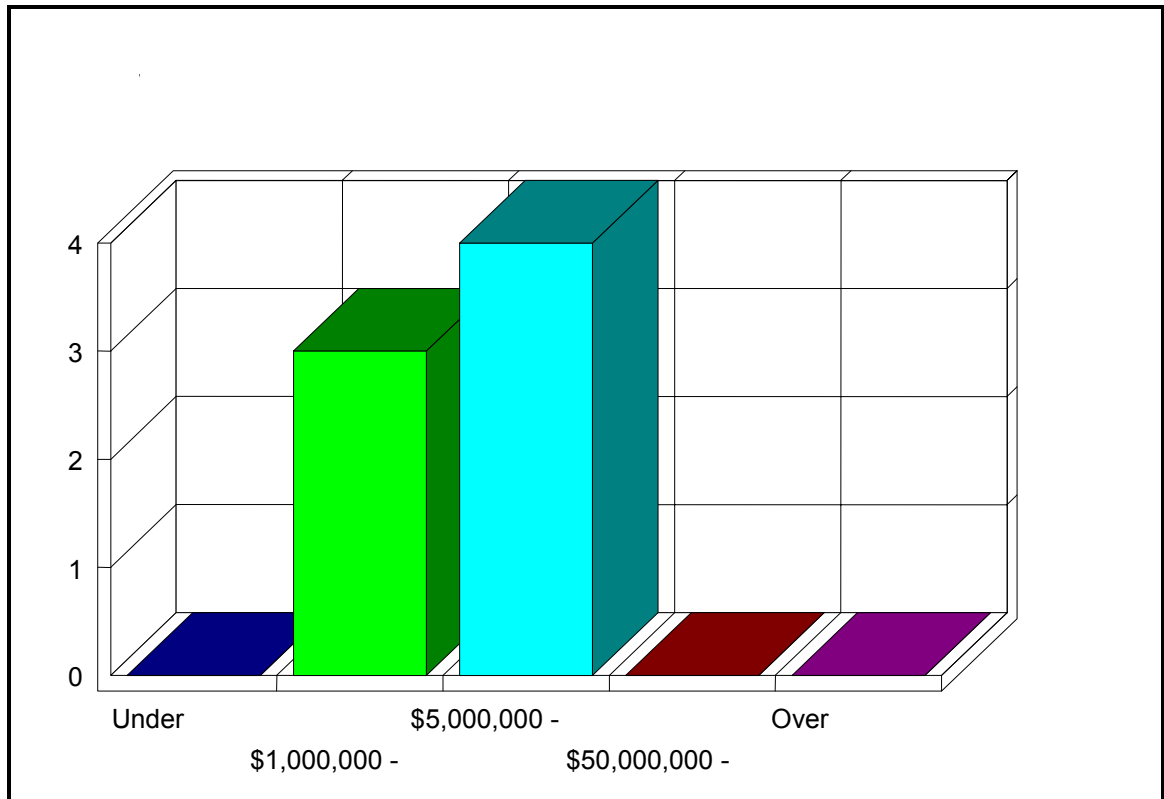


Figure 8: Company's Annual Sales Volume [Developed by Researcher]

The data in the graph indicate that all seven respondents fell into either one of two categories; \$1,000,000 - \$5,000,000 per year or \$5,000,000 - \$50,000,000. Additionally, 3 (or 47 percent of the respondents) placed themselves in the first category and the remaining 4 (or 57 percent of the respondents) placed themselves into the latter category. Without knowing the exact Standard Industrial Classification (SIC) Code for each respondent, it would be difficult to make a completely accurate assessment as to whether

these companies could be classified as large or small businesses, as businesses in different industries are judged by different standards. [Ref. 43] However, all of the survey respondents fell into an annual sales volume range of \$1,000,000 - \$50,000,000, which appears to tend toward the larger category of businesses.

Question 4 asked the survey respondents to identify their company’s annual R&D/technology budget. Recognizing that respondents would most likely list their current annual R&D/technology budget, the question specifically asked them to approximate over the last five years their average annual R&D/technology budget. Considering that the period being analyzed ranged from FY 94 – FY 00, the researcher felt that a budget figure averaged over the last five years would be a more appropriate number to consider when discussing how an OT agreement administered a few years ago allowed DOD to tap into their company’s technology resources. For this question, respondents were given an open-ended space to respond so that their exact answers would be captured. All seven respondents answered this question and the results are displayed in Table 5.

Respondent	Average Annual R&D/Technology Budget
1	Internally funded: \$60,000 Externally funded: \$500,000
2	\$400,000
3	\$1,000,000
4	\$500,000
5	\$2,000,000
6	\$300,000
7	\$400,000

Table 5: Companies’ Five-Year Average Annual R&D/Technology Budget [Developed by Researcher]

Question 5 asked the surveyed companies to categorize the relationship with DOD that resulted from the OT arrangement. The thrust of this question was to determine if the respondent was either a prime contractor for DOD, part of a consortium of companies participating in the OT, or a sub-contractor to a prime that had formed a relationship with DOD using an OT. Survey respondents were asked to place themselves into one of the following three categories that best described their company's participation in the OT:

- A one-to-one relationship involving only your company and DOD.
- A part of a consortium of companies participating in the Other Transaction with DOD.
- The result of a prime to sub-contractor relationship your company had with another firm that was doing business with DOD.

All seven respondents answered this question and all seven fell into one of the two following categories; a) a one-to-one relationship involving only their company and DOD, or b) a prime to sub-contractor relationship their company had with another firm (e.g., the prime) that was doing business with DOD using an OT. As it turned out, four of the seven (57 percent) fell into category (a), which identifies them as a prime contractor in an OT-based relationship. Consequently, the remaining three (43 percent) can be characterized as non-traditional sub-contractors working for a prime that had an OT-based relationship with DOD. Again, the anonymity of the survey precludes the researcher from determining exactly which prime or subcontractors these respondents were. However, from a pure numbers perspective, this survey pool can now be identified to represent 13 percent (4 of 30) of the total number of non-traditional prime contractors and 3 percent (3 of 89) of the total number of non-traditional sub-contractors that conducted business with DOD from FY 94 to FY 00 using an OT.

Question 6 asked respondents to characterize their company's position with respect to their primary competitors in the industry and to indicate whether or not their competitors conducted business with DOD. Additionally, this question specifically asked respondents to choose an answer that best characterizes their company's position at the time they participated in the OT with DOD. Respondents were given the following three options and asked to select the one that best applied:

- The only company amongst our competitive industry that was doing business with DOD.
- One of several companies within our competitive industry that was doing business with DOD.
- The only company within our competitive industry that was not doing business with DOD.

All seven respondents answered this question and all seven (100 percent) placed themselves in the same category; one of several companies within their competitive industry that was doing business with DOD. This is very interesting in that there were companies in every one of the respondents' industries that clearly were conducting business with DOD, yet before the OT arrangement, their company chose not to enter that market themselves. So, at least for these respondents, it's not a case where DOD accessed a previously untapped market using the OTs. Without more specific information such as how much business their competitors were conducting with DOD, it would be difficult to make a statistically accurate assumption. However, it appears, on the surface at least, that the DOD market existed for their industry, but significant enough reasons (possibly in the form of barriers) existed before the OT relationship to cause them to decide not to enter the DOD market.

Question 7 asked the companies to simply indicate whether they had ever done business with any other Federal Government Agency prior to entering into the OT agreement with DOD. Respondents were asked to select either "Yes" or "No." The results indicate that five of the seven (71 percent) companies had done business with another Federal Agency prior to their OT agreement with DOD and only two (29 percent) had not. This is very surprising in that the DUSD (AT&L) definition of a non-traditional company does not focus exclusively on companies that do not do business with DOD. Rather, the definition is broad enough to include all Federal Government Agencies. Given that most Federal procurement rules apply to all Federal Agencies, it's interesting to find that the majority of these respondents had conducted business with the Federal Government before, but not with DOD specifically.

2. Determining if the Other Transaction Attracted Them

The purpose of questions 8, 9 and 10 was to solicit feedback from survey respondents as to whether it was the OT that attracted them to do business with DOD. And if it was, what was it about the OT that either attracted them, or at least, enabled them to participate in a business relationship with DOD.

Question 8 asked respondents to cite the top five reasons why their company did not conduct business with DOD prior to the OT agreement. Question 8 was designed to initially “set the stage” for this section by asking survey respondents to cite their top five reasons why their company did not conduct business with DOD prior to the OT agreement. Several examples of “typical” reasons why companies choose not to do business with the Government, such as stringent audit requirements, technical data rights, restrictions on foreign access to technology, burdensome paperwork, etc, were given to the respondents as part of the question. The purpose of this question was to encourage the respondents to identify their previous barriers to conducting business with DOD, so that later questions could ask which (if any) of these barriers were overcome as a result of using an OT. Survey respondents were given an “open-ended” data area in which to provide their responses.

None of the seven survey respondents answered Question 8. After further investigation as to why there was a 0 percent response rate for this question, the researcher identified a technical “glitch” in the survey construction that prevented respondents from filling in anything for this question. Unfortunately, it was not detected until all of the responses were received and processed. However, a later question captured much of the same information that Question 8 was intended to set up.

Question 9 directly targeted the issue of determining whether it was the OT that attracted them by asking if there were specific provisions of the OT agreement that enabled their participation in a business relationship with DOD. Respondents were asked to simply answer either “yes” or “no.” One hundred percent of the responding companies answered this question. Figure 9 identifies the breakdown of responses according to the two possible answers.

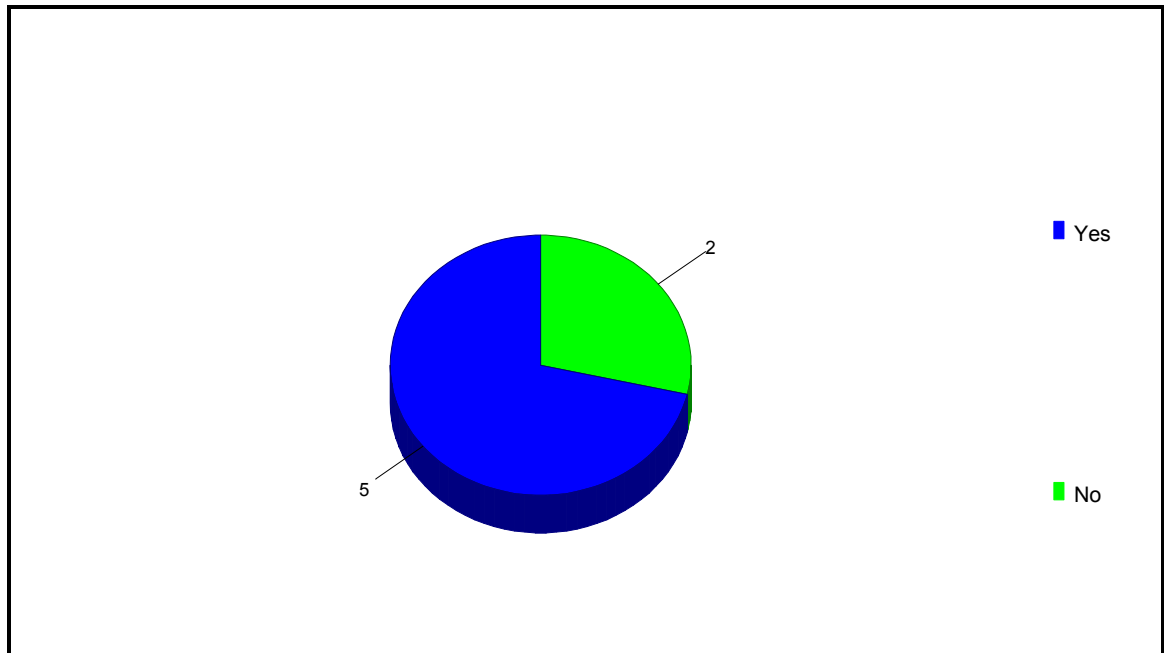


Figure 9: Determining If There Were Specific OT Provisions That Enabled Their Company’s Participation [Developed by Researcher]

As the figure above indicates, five of the seven respondents (71 percent) answered “yes,” meaning that there were specific provisions in the OT that enabled their participation. The remaining two (29 percent) selected “no.” At first glance, it appears that 71 percent of the companies were attracted to the Defense market as a result of the OT. For this group, the question now becomes what specific parts of the OT attracted them. Conversely, Figure 9 also suggests that 29 percent of the respondents might have entered into a relationship with DOD, regardless of whether an OT was used or not. Without the specific data regarding their prior barriers to conducting business with DOD (i.e., Question 8), it is difficult to speculate with any accuracy at this point.

Question 10 was designed as a follow-on question for those companies that answered, “yes” to Question 9. The purpose of this question was to identify what specific provisions of the OT enabled them to participate in a business relationship with DOD. One hundred percent of the eligible respondents answered this question. Table 6 identifies the specific answers to this question.

Respondent	Provisions of OT that enabled their participation
1	Provisions which allowed us to capitalize the R&D
2	Not eligible – answered “no” to Question 9
3	Full commercial recoupment of IR&D
4	Advanced Concept Technology Demonstration (ACTD) rules allowing non-competitive awards
5	ACTD rules allowing non-competitive awards
6	Retention of intellectual property rights
7	Not eligible – answered “no” to Question 9

Table 6: Specific OT Provisions That Enabled Their Participation [Developed by Researcher]

At this stage, it is difficult to make any assumptions regarding central themes in OT provisions. It is interesting to note that two companies responded with the exact same answer (e.g., “ACTD rules allowing non-competitive awards”). The overall diversity of the data set could, however, provide an argument that every OT and every business relationship is unique in its own respect. Further data and analysis will build on this theme.

3. Tapping into Non-Traditional Technology

The purpose of Questions 11, 12 and 13 was to specifically identify how much of the non-traditional companies’ R&D resources DOD had access to during the performance of their OT agreement. Clearly, this section directly addresses the heart of this thesis, which is to analyze DOD’s use of Section 845 OTs as a method of tapping into non-traditional R&D resources. The latter two questions carry this theme even farther by determining if the initial relationship formed using the OT enabled DOD to continue tapping into the companies’ R&D resources (e.g., “opened the door” to follow-on relationships).

Question 11 asked the survey respondents to estimate the percentage of their company’s total R&D/technology resources to which DOD had access both before the OT-based business relationship was formed and after. Eighty six percent of the companies responded to this question and the results are summarized in Table 7.

Respondent	Percentage of R&D Resources DOD Tapped Into
1	Did not answer the question
2	Before: 25% After: 90%
3	Before: 90% After: 90% (but at a 200% greater dollar value)
4	Before: 90% After: 90%
5	Before: 90% After: 90%
6	Before: 20% After: 30%
7	Before: 25% After: 90%

Table 7: Percentage of Non-Traditional R&D Resources DOD Tapped Into – Before and After the OT Agreement [Developed by Researcher]

Much like the answers to previous questions, there appears to be no central theme to these answers. Fifty percent of the time, DOD did not have any greater access to the non-traditional suppliers’ R&D resources as a result of the OT. However, in 33 percent of the cases, DOD had significantly greater access to non-traditional R&D resources after

the OT-based relationship was formed. Without specific knowledge as to the type or value of the technology gained, it is difficult to make judgments regarding any benefits that DOD might have gained as a result of having access to a greater percentage of non-traditional R&D.

Question 12 asked companies to indicate whether their OT-based relationship with DOD “opened the door” to follow-on business with the Department. Respondents were asked to simply indicate either “yes” or “no.” Figure 10 identifies the breakdown of responses according to the two possible answers.

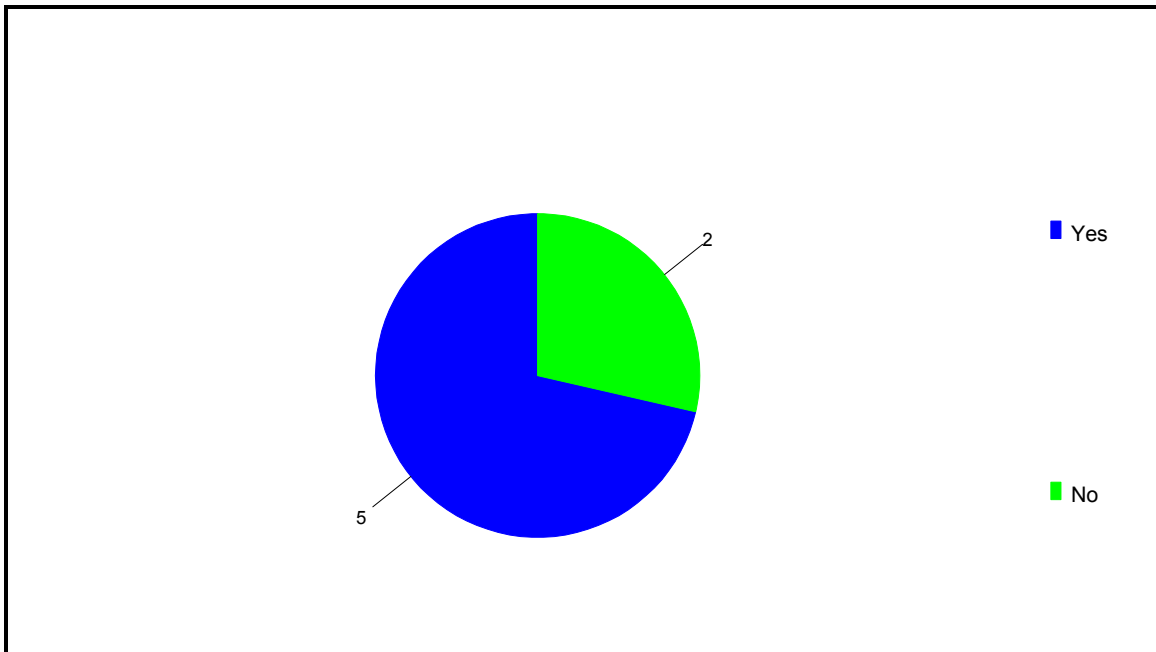


Figure 10: Identifying Whether Follow On Business With DOD Was Pursued After The OT-Based Relationship [Developed by Researcher]

Figure 10 indicates that in 71 percent of the cases, the OT-based relationship led to follow-on business with DOD. As pointed out previously in Chapter II, current OT legislation specifically states that Section 845 OTs should be crafted in such as way as to encourage the non-traditional companies to pursue follow-on business with DOD. Current OT regulations also point out that DOD is encouraged to use traditional FAR-based fixed-price type contracts as the vehicle for forming these follow-on relationships. The next survey question addresses this very point.

A deeper look at the two companies that did not participate in follow on business with DOD after their OT agreement reveals a couple of interesting facts. First, one of these companies stated in a previous answer that there were no specific provisions in the OT that encouraged them to participate in the Defense market. This answer alone might lead one to believe that perhaps the company would have done business with DOD regardless of whether they used an OT or not. Yet the same company did not participate in follow-on business with DOD after the OT agreement was finished. Even more interesting is the fact that this same company indicated that they had conducted business with other Federal Government agencies prior to their OT relationship with the Government. On the surface, these facts seem to conflict with each other. It is difficult to make any sort of judgment without further information as to why the company did not participate in follow on DOD business.

The second company that did not participate in follow on business indicated in the previous question that there were specific provisions in the OT agreement that enabled them to participate in a relationship with DOD. This case would seem to make more sense if DOD did in fact encourage this company to participate in future business, but with a traditional FAR-based contract as the vehicle (instead of an OT). The OT might have been the only reason the company participated in a relationship and without it, the barriers would be too great for them to continue. Of course, additional information would be required in order to confirm this.

Question 13 was designed as a follow-on to the previous question. Question 13 asked the companies that participated in follow-on business with DOD after the OT (i.e., companies that answered “yes” to Question 12) to identify the type of vehicle they used to form the follow-on relationships with DOD. Respondents were asked to pick one of the following three choices:

- Traditional Government procurement contracts.
- Additional OT agreements.
- Both traditional Government procurement contracts and OT agreements.

Eighty percent of the companies that participated in follow-on business with DOD answered this question. Figure 11 displays the results to Question 13.

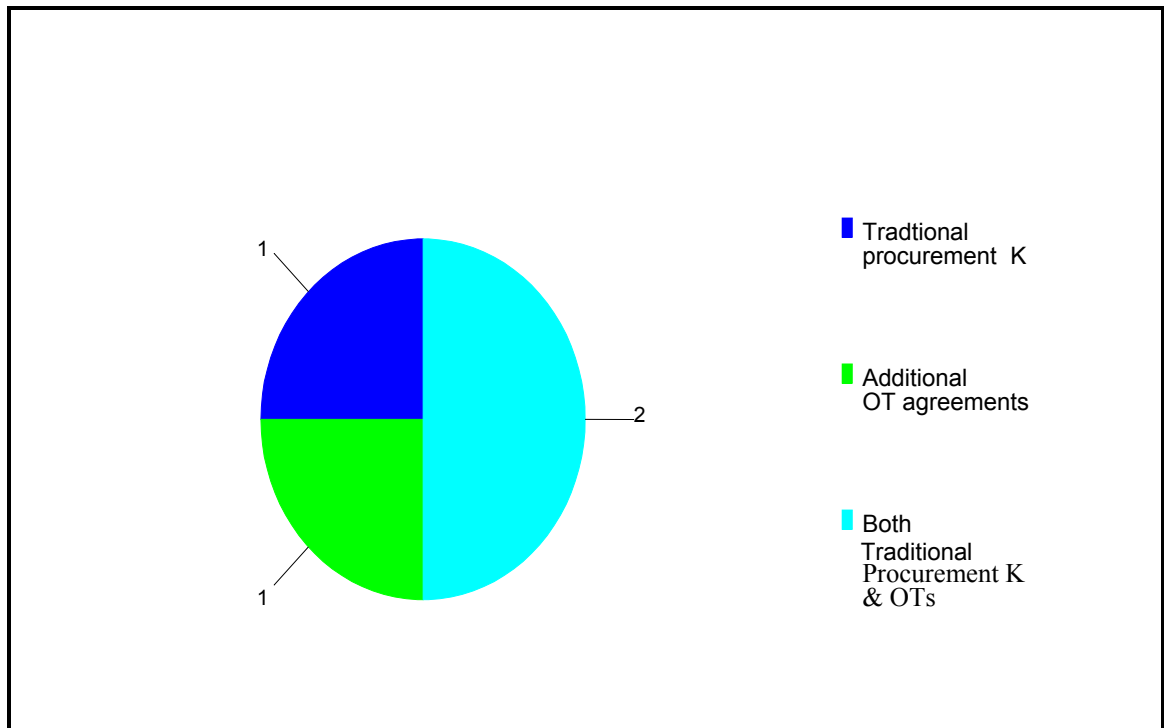


Figure 11: Type Of Vehicle Used To Form Follow-On Relationships With DOD
[Developed by Researcher]

Figure 11 indicates that one company used purely traditional FAR-based contracts as the vehicle for their follow-on relationships with DOD. Additionally, further research reveals that this same company had also done business with other Federal Government agencies prior to their OT agreement with DOD. Consequently, they may already have had the infrastructure in place to prepare and administer traditional FAR-based Government contracts. If this was in fact the case, then one might ask why they had not entered the Defense market before.

Figure 11 also reveals that one company participated in follow-on business with DOD using additional OTs as the vehicle. There are a couple of interesting facts regarding this statistic. First, it runs directly counter to the OT regulations, which state that DOD should pursue future relationships with non-traditional companies (although

they wouldn't be non-traditional anymore at that point) using traditional contracts. Secondly, this same company responded to Question 9 by indicating that there were no specific provisions in the OT that enabled their participation in the Defense market. Again, this fact alone could be interpreted to mean that they would have done business with DOD regardless of whether an OT was used or not. However, the fact that they participated in follow-on business using an OT, rather than a traditional contract, would run contradictory to this interpretation.

4. Benefits of an Other Transaction

The purpose of Question 14 was to get survey respondents to identify any benefits they perceived DOD gained as a result of the OT agreement with their company. Reports have been published that detail DOD's perceptions of the benefits they have gained as a result of using Section 845 OTs. [Ref. 6] In fact, DOD produces an annual report to Congress that specifically identifies the benefits they feel have been obtained as a result of having the authority. This researcher also believes that it is important for DOD officials and Agreement Officers to be aware of the non-traditional suppliers' perceptions on this issue as well. Clearly, Agreement Officers must have a better understanding of the benefits of OTs from the suppliers' perspective if they are going to be successful in crafting OTs that will attract more non-traditional companies in the future.

Question 14 asked the non-traditional companies to identify, in their opinion, the benefits DOD received as a result of participating in the business relationship with their company. Eighty six percent of the respondents answered this question. Table 8 presents below the opinions from each respondent.

While each of the respondents answered this question a little differently, it appears that one central theme amongst the group did surface, which is their belief that DOD primarily benefited by gaining access to more current technology. This fact alone is encouraging in that the primary legislative intent of Section 845 OTA is for DOD to use it as a tool for tapping into "cutting edge" commercial technology. Given these results, it appears that at least the non-traditional suppliers are attuned to this intent. As previously cited in Chapter II, DOD officials routinely point out many other benefits to using Section 845 OTs, such as helping to streamline acquisition practices and processes

without having to apply for a waiver from statute or regulation and giving Agreement Officers flexibility in negotiating Intellectual Property rights. [Ref. 6]

Respondent	Benefits to DOD
1	Unique statement of work that meets both military and commercial needs (e.g., dual use)
2	* Did not answer the question *
3	Access to emerging commercial technology.
4	Better, faster, cheaper technology at no investment cost.
5	Unique commercial products and processes and better, cheaper and more readily available technology.
6	Too early to tell. Other efforts far from complete.
7	Access to updated technology.

Table 8: Non-Traditional Supplier Perception of DOD Benefits [Developed by Researcher]

5. Non-Traditional Arrangements and Practices

The purpose of this section of questions was to identify central tenets of the non-traditional companies' commercial market business relationships and any best business practices they utilize to evaluate future business relationships. This kind of information could be extremely valuable to DOD officials and Agreement Officers as it might help them to structure OTs that are more attractive to non-traditional companies.

Question 15 asked the non-traditional companies to identify the ways in which their OT agreement with DOD mirrored the business relationships with their private industry customers that had the most access to their R&D efforts. Eighty six percent of the respondents answered this question and the results are displayed in Table 9.

Respondent	Ways in which the OT mirrored commercial arrangements
1	On issues regarding retention of critical Intellectual Property
2	* Did not answer the question *
3	None – it does not mirror commercial arrangements in any way.
4	No specifics, but both were crafted to allow better technology, lower prices plus higher return.
5	Mirrors them in most ways
6	Mirrors them in most ways
7	None – it does not mirror commercial arrangements in any way.

Table 9: Way In Which OTs Mirror Private Industry Business Relationships [Developed by Researcher]

The data contained in Table 9 indicate that the answers to this question are split. Fifty percent of the companies responded by saying that none of the specific tenets of the OT mirrored their commercial business arrangements in any way, while the remaining half either mirrored them in most ways or in Respondent 1’s case, in one major area (critical IP).

Obviously, the data from this survey group are not overwhelmingly skewed in either direction. However, there is an interesting fact associated with this question. The three respondents who indicated that OTs did not mirror their commercial business arrangements all belonged to similar industries: software and advanced modeling. In contrast, the other three companies who responded by saying OTs did mirror their commercial arrangements operated in completely different industries. Given this information, it is quite possible that the answer to the question of how OTs mirror commercial arrangements is industry dependent. If this is in fact true, DOD Agreement Officers need to understand the particular nuances of the industry they are targeting if they are to be successful at crafting OTs that would attract non-traditional companies from that industry.

Question 16 asked the survey respondents to identify areas that their company feels are the most important to consider when evaluating whether to pursue a business relationship with a new commercial customer or establish ground in a new market. Eighty six percent of the respondents answered this question and the results are displayed in Table 10.

Respondent	Areas to consider when evaluating new relationships or markets
1	Potential for long term relationship, Return on Investment, ability to retain IP
2	* Did not answer the question *
3	Market potential (i.e., \$-wise), enterprise potential
4	All of the above (“All of the above” refers to the examples cited in actual survey question: dollar size and profitability of deal, potential for long-term relationship, ease of negotiations, protection of technical data rights and proprietary information, flexibility of business arrangement and ability to allow global access to technology.)
5	Relationship with DOD and all of the above (All of the above” refers to examples cited in actual survey question: dollar size and profitability of deal, potential for long-term relationship, ease of negotiations, protection of technical data rights and proprietary information, flexibility of business arrangement and ability to allow global access to technology.)
6	Potential for long-term profitable relationship.
7	Potential for long-term relationship, ability to retain data rights and Return on Investment.

Table 10: Areas Companies Consider When Evaluating New Relationships or Markets
[Developed by Researcher]

The purpose of this question was to provide insight into the things that non-traditional companies feel are necessary in order to encourage them to pursue a new business relationship or enter into a new market. If DOD is going to be successful in using Section 845 OTs to attract non-traditional companies to the defense market, it first must understand what motivates these non-traditional companies to seek new business. While each of the respondents gave slightly different answers, their specific answers do not appear to be surprising. In fact, the DOD studies referenced in Chapter III identify many of these same issues as being common barriers to preventing non-traditional companies from entering the Defense market. If nothing else, these responses prove that Agreement Officers must clearly understand what motivates the companies they are trying to attract and that each company has their own unique motivators. If they fail to do so, their OTs may not accomplish its mission.

D. SUMMARY

This chapter examined DOD/non-traditional supplier OT-based relationships from the suppliers' perspective. Different facets of the relationship were looked at using a survey specifically targeted at non-traditional commercial companies that conducted business (from FY 94-00) with DOD for the first time using a Section 845 OT as the vehicle for structuring their relationship. The survey's results identified a number of different themes regarding the type of non-traditional companies that were attracted, the reasons why they were attracted, the extent that DOD accessed their R&D resources as a result of the relationship and ways in which the OT agreement compared with commercial industry business relationships.

The next chapter will analyze these themes with respect to DOD's views on the use and benefits of Section 845 OTs.

V. DATA ANALYSIS

A. INTRODUCTION

The previous chapter detailed a survey the researcher conducted with companies that satisfied both of the following two criteria: (1) participated in a business relationship with DOD using a Section 845 OT as the vehicle for structuring that relationship; and (2) were classified according to DUSD (AT&L) as non-traditional companies at the time they participated in the OT-based relationship. The overall purpose of the survey was to get non-traditional companies' views on issues regarding DOD's use of Section 845 OTs. Chapter IV presented the survey data and identified areas that seem to suggest common themes amongst the survey respondents. More specifically, interesting commonalities were found in the survey data pertaining to the type of non-traditional companies that DOD attracted to the defense market, the reasons why they were attracted, the extent to which DOD accessed their R&D resources during the relationship and the ways in which the OT agreement compared with their commercial industry business relationships.

Since it was given Section 845 authority in the late 1990's, DOD was tasked to report to Congress and Government officials on the benefits of its use. Chapter II described in detail Congressional intent in providing DOD with this authority and Chapter III discussed why it is so important for DOD to have the ability to access private industry's "cutting edge" R&D resources. Consequently, there already exists much published information on DOD's use of Section 845 OTs and its perceived benefits to having the authority.

This chapter further explores the issues identified in Chapter IV by providing an analysis of those issues with respect to DOD's use of Section 845 OTs and its perceived benefits for using the authority. Facts regarding DOD's use of the authority and its perceived benefits are obtained from the following sources:

- 2000 GAO report entitled *DOD's Guidance on Using Section 845 Agreements Could be Improved* [Ref. 6]
- 2001 GAO report entitled *Information on the Federal Framework and DOD's Other Transaction Authority* [Ref. 44]

- FY 94 – FY 00 DOD Annual Reports on Cooperative Agreements and Other Transactions Entered into Under 10 USC 2371 [Ref. 41]

B. NON-TRADITIONAL COMPANIES ATTRACTED

1. Classification Issues

Chapter II provided a detailed account of how OTA evolved from its original form as it was given to DARPA in 1989. Included in that account was a description of the most recent revision to Section 845 authority, Section 803, which clearly re-directed the legislation's focus toward providing DOD with a tool to help it attract non-traditional companies and thus, tap into their R&D resources. DOD's Director of Defense Procurement (DDP) was given the responsibility to define a non-traditional company and track their participation in Section 845 OT-based relationships accordingly.

One issue that surfaced regarding DOD's ability to attract non-traditional companies simply involves the definition of a non-traditional company. As stated previously in Chapter IV, DDP identified and tracked non-traditional company participation in Section 845 OT relationships according to the following definition:

A business unit that has not, for a period of at least **one year** prior to the date of the OT agreement, entered into or performed on (1) any procurement contract that is subject to full coverage under the cost accounting standards prescribed pursuant to Section 26 of the Office of Federal Procurement Policy Act (41 U.S.C. 422) and the regulations implementing such section; or (2) any other procurement contract in excess of \$500,000 to carry out prototype projects or to perform basic, applied, or advanced research projects for a Federal agency. [Ref. 4: DL1.12]

Clearly this definition is meant to apply to companies that have not participated in business relationships with any Federal Government agency (in accordance with the stated parameters), not just DOD. Yet, question seven of the survey asked respondents to identify whether they had ever done business with another Federal Government agency prior to the entering into the OT agreement with DOD and 71 percent of the companies responded "yes," meaning that they had done business with other Federal agencies prior to entering into the OT agreement with DOD. Apparently however, these companies had

not done business with another Federal agency within a year prior to the OT agreement date.

Chapter II detailed Section 845 OTA's current legislative intent, which is to provide DOD a tool to entice "leading edge" commercial companies that previously did not conduct business with it to enter the defense market so that their technology can be leveraged for military use. Chapter III discussed technology trends in the DTIB and private industry over the last decade and profiled the type of "leading edge" companies that DOD needs to attract. The facts presented in Chapter III indicate the companies that DOD needs to attract currently own two-thirds of the nation's advanced technology and also are not currently doing business with the Federal Government on any level.

Interestingly enough, the survey results suggest that even though the companies that DOD is classifying and tracking as "non-traditional" meet its definition, they may not truly live up to the spirit of the definition of a non-traditional company. It is difficult to imagine that a company's barriers to participating in the defense market would be much different than their barriers to participating in the Federal Government market in general. According to DOD studies cited in Chapter III, many of the "leading edge" companies that DOD is trying to attract are choosing not to conduct business with it because of those barriers. Therefore, it is also difficult to imagine that a company that participated in recent Federal Government business (excluding the defense market) is the same kind of company that DOD needs to attract.

Even though DDP was given the responsibility to define and track for DOD non-traditional company participation, there exists confusion within the Federal Government as to what constitutes a non-traditional company. In their 2000 report entitled *DOD's Guidance on Using Section 845 Agreements Could be Improved*, GAO raised this issue. Specifically, it is pointed out that DOD's Inspector General (DODIG) independently collected non-traditional company participation in Section 845 OT statistics, but defined a non-traditional company as one that had not performed research on cost-based contracts or that had been subject to an audit by Defense Contract Audit Agency within the past **3 years**. [Ref. 6: p. 14]

This represents a dramatically different interpretation of a non-traditional company than DDP's. This difference may explain why there also exist some inconsistencies amongst DOD Agreement Officers' comments in their annual report to Congress and DDP's classification of the supplier. For instance, DDP classified a prime supplier involved in a Section 845 OT agreement as non-traditional and tracked it as such. However, the Agreement Officer specifically stated in that year's DOD report to Congress on its use of OTs that even though the OT yielded participation from a traditional defense contractor, the OT agreement encouraged a closer relationship between the Government and the contractor than would normally be permitted under a FAR-type contract. [Ref. 41] Clearly, the Agreement Officer perceived the supplier as being a traditional defense contractor (possibly as a result of that company's familiarity with Government acquisition procedures), but DOD was tracking it as a non-traditional company. Again, it is not likely that these are the kinds of companies that the legislation was designed to attract.

2. Industry and Market Issues

The private industry technology trends of the last decade that were discussed in Chapter III suggest that there are many high technology industries and markets out there to which DOD has very little if any access e.g., certain "high tech" communications and electronics markets. The specific barriers that prevent DOD from having access to these industries and markets were also discussed. First of all, it is not difficult to conclude that these high technology industries and markets contain precisely the type of non-traditional companies that DOD is trying to attract. And secondly, it is not difficult to conclude that the companies operating in these unique markets have little if any Government experience, are chasing many of the same kinds of customers, and therefore, are most likely unaware of emerging Government business opportunities (because they don't operate in the same "circles" as DOD).

Question six of the survey asked the respondents to characterize their company's position relative to their primary competitors with respect to the level of DOD business being conducted. Specifically, they were asked to select one of the following three options: 1) the only company within their competitive market doing business with DOD,

2) one of several companies within their market doing business with DOD, or 3) the only company within their market not doing business with DOD. Ironically, 100 percent of the respondents indicated they were one of several companies within their competitive market conducting business with DOD.

These results completely contradict the belief that the companies DOD needs to attract are operating in virtually untapped industries and markets. Obviously in the cases represented by the survey data, DOD attracted “non-traditional” companies that were operating in markets that have already been tapped by DOD. Given this fact, one could question whether the technology DOD accessed as a result of the OT-based relationship could have been obtained from any of the other companies that DOD was already doing business with in that same market. And even if not, what was the benefit to DOD of this technology as compared to the technology available in the untapped markets? In other words, given a finite funding level, shouldn’t DOD be pursuing the technology in the untapped markets? Of course, these would be difficult questions to answer without any further data.

The fact that 100 percent of the survey respondents categorized themselves as one of several companies operating in their competitive market that was doing business with DOD may not be surprising considering the way that DOD markets its Section 845 OTs. In several of the comment sections in DOD’s annual report to Congress on its use of OTs, Agreement Officers explicitly stated that they attracted the non-traditional company using a Broad Agency Announcement (BAA) or Commerce Business Daily (CBD) solicitation. [Ref. 41] It stands to reason that companies operating in predominantly defense markets (even though they may not currently be doing business with DOD) are going to be reading the “traditional” defense solicitations. Likewise, the companies that are operating in the untapped DOD markets are operating in their own unique circles and therefore, are not going to be reading publications such as the CBD or noticing BAAs. Based on these facts, one might argue whether the non-traditional companies that were actually attracted are truly the type of non-traditional companies that the legislation intended it to attract.

C. BENEFITS

Other Transaction Authority in general represents a radical departure from the statutes and regulations that frame DOD's traditional contracting environment. In a traditional contracting scenario, DOD agents are accountable for adhering to all applicable rules and regulations. In many cases, these rules and regulations embody principles such as strong Government control and oversight, adherence to rigid contract specifications and the promotion of future competition. In contrast, Section 845 OTA provides DOD agents with tremendous flexibility, but a flexibility that can only be utilized for a few specific purposes (which are cited in Chapter II).

1. Tapping Into Commercial Research and Development

Congress developed Section 845 OTA and gave it to DOD in order to fulfill specific purposes. DUSD (AT&L) identifies its perspective on DOD's purpose for using Section 845 OTA in its 2001 OT Guide.

It is in DOD's interest to tap into the research and development being accomplished by non-traditional defense contractors, and to pursue commercial solutions to defense requirements. One justifiable use of this authority is to attract non-traditional defense contractors that participate to a significant extent in the prototype project. [Ref. 4: Section C1.5]

It is no surprise that DUSD's (AT&L) stated purpose for Section 845 mirrors the legislation's primary stated purpose, which is to give DOD the ability to attract non-traditional suppliers and ultimately access their technology resources. As previously mentioned, several issues exist regarding DOD's ability to not only attract non-traditional companies in general, but also its ability to attract the right kind of non-traditional companies. In addition, evidence suggests that there is also reason to analyze DOD's success in using OTs as a method for tapping into commercial R&D resources.

As mentioned numerous times throughout this thesis, DOD's most frequently stated primary expected benefit to using Section 845 OTA is to give it access to more non-traditional R&D resources. There is no disputing the fact that this is really the authority's primary intent. Congress placed it in the legislation's language. DUSD

(AT&L) stated it in its most current OT regulatory document and GAO identified it in a 2000 report as DOD's most often cited expected benefit. [Ref. 6: p. 13]

Yet, given all of the publicity that this expected benefit attained, DOD has not identified any quantifiable evidence to measure its success at accessing non-traditional R&D resources. Chapter IV identified and discussed data pertaining to DOD's success rate at attracting non-traditional companies. However, the larger question involving how much of the non-traditional R&D resources were tapped into has never been quantified or tracked. GAO stated in its 2000 report on DOD's use of Section 845 OTs that there were previous attempts made by DOD to do so, but they were unsuccessful.

DOD officials told us they have been attempting to determine the extent that commercial firms were participating on Section 845 agreements since October 1997. At that time, DOD established a requirement for Agreement Officers to provide a report, which was to identify (among other things) whether the prime contractor or consortium members had performed any prior research efforts for DOD. This requirement, however, may not result in any meaningful indicators of the expected benefits. [Ref. 6: pp. 13-14]

Interestingly enough, DUSD's (AT&L) April 2000 OT Guide established a new requirement for Agreement Officers to track as a metric the involvement of non-traditional contractors that participate to a significant extent in a prototype project administered using an OT. [Ref. 4] However, this metric is intended to only identify and track the fact that a company is non-traditional and only so that DOD's success rate of attracting non-traditional companies using OTs can be more easily quantified. Again, this does nothing to address the more important question regarding how much of the non-traditional companies' R&D resources DOD was able to tap into using the OT.

In an effort to actually address this idea, survey question 11 asked the non-traditional respondents to identify the percentage of their companies' R&D efforts to which DOD had access both before and after the OT-based business relationship was formed. Exactly half of the respondents stated that DOD had access to 90 percent of their companies' technology both before and after their participation in the OT agreement. Clearly, the OT had no impact on the amount of non-traditional R&D resources that DOD had access to in these situations. Additionally, only in 33 percent of the cases did

DOD have access to a significantly greater amount of the companies' R&D resources after the OT-based relationship was formed. One other interesting fact exists regarding the 50 percent of the cases in which the OT had no impact on DOD's ability to tap into non-traditional R&D resources. Every one of these companies indicated they had participated in business relationships with other Government agencies prior to their OT relationship with DOD. Consequently, it might be quite possible that these companies are only non-traditional by definition, and actually have been operating in the defense market before (but just not in the last year).

A question in the survey's demographics section asked respondents to approximate their companies' average annual R&D budget over the last 5 years. The results were surprising. Only 29 percent of the respondents had annual R&D budgets of one million dollars or more. Even more surprising was the fact that the remaining 71 percent had annual internal R&D budgets of half a million dollars or less. In terms of today's high technology dominated industries, these annual R&D budgets represent very small numbers. This fact, in combination with the relatively small access to R&D resources DOD seemed to have gained after the OT arrangement, provides further evidence that OTs are not attracting the right kind of non-traditional companies.

Of course the pure amount of a non-traditional company's R&D resources that DOD tapped into may not always be the most accurate means for determining the value of its benefit obtained. The matching of a specific technology type to a specific DOD need for that technology could be just as valuable, regardless of how much of that company's total R&D resources it represented. For example, an Agreement Officer stated the following benefit in DOD's FY 2000 report to Congress on its use of OTs:

The use of an OT has resulted in an additional benefit, not addressed above. Arc fault detection technology is a recent development and the methods of identifying how an electrical arc starts fires are still under investigation. However, the promise of detecting arc faults and interrupting them before a fire starts is a great concern within the Navy maintenance and air safety community. [Ref. 41]

2. Other Benefits

GAO's 2000 report on DOD's use of Section 845 OTs stated the following as the three top expected benefits to using OTs most often cited by DOD officials; 1) the use of commercial products or processes, 2) attracting commercial firms, and 3) increased flexibility in negotiating terms and conditions. [Ref. 6: p. 12] The number one most often cited expected benefit, the use of commercial products or processes, refers to the issue of tapping into non-traditional R&D resources, which was covered in the previous section.

In much the same way it approached the expected benefit of tapping into commercial R&D resources, DOD generally offers no quantified measures of benefit number two either. However, the new requirement for Agreement Officers to track non-traditional supplier participation from FY 2001 forward will provide DOD a quantified measure for number two in the future. Merely tracking the number of non-traditional companies participating in OT-based relationships with DOD does not provide enough information necessary to appropriately analyze an OT's ability to attract non-traditional company participation. For example, a simple statement such as "DOD's total number of OT agreements in a period involved 'XX' percentage of non-traditional companies" does not tell the entire story. Without further analysis, the conclusion might erroneously be made that an increase in that percentage over the next period meant that OTs were being used more successfully to attract non-traditional companies. The implied suggestion is that it was the OT that attracted the non-traditional company. This very well might not be the case.

Survey question nine asked respondents to indicate if there were specific provisions in the OT that enabled their participation in a business relationship with DOD. While it's true that an overwhelming majority (71 percent) answered "yes," the fact that 29 percent answered "no" provides enough grounds for further investigation and could lead one to believe that the OT itself does not always attract non-traditional companies. There might very well be other reasons why those companies chose to pursue defense business, which implies that they would have participated in a relationship with DOD

regardless of whether an OT was used or not. The reason why it is so important for DOD to identify these reasons is so that Agreement Officers can better understand what in fact motivates non-traditional companies to pursue defense business, and thus allow them to more frequently include these motivators in their OTs.

Survey question 10 was a follow-on question for those respondents that answered “yes” to the previous question. Question 10 asked the companies which stated there were specific provisions of the OT that enabled their participation in the relationship to identify those provisions. The point of this question was to determine what part of the OTs changed their mind about participating in the defense market, that is to identify what barriers were overcome as a result of the OT. Given this information, a comparison could then be made between the stated barriers and the most common barriers reported in DOD studies.

Interestingly enough, every company’s answer but two was different. Additionally, the specific answers they provided did not completely match with the most commonly cited barriers to pursuing defense business. As identified in Chapter III, the intellectual property rights clauses found in traditional FAR-type contracts are the Government regulation that companies most frequently cite as their reason for refusing Government R&D contracts. [Ref. 32: p. 18] However, only 20 percent of the respondents in this survey identified intellectual property rights clauses as the specific clause that enabled their participation in the OT agreement. Given the diversity in answers, one might be led to believe that different non-traditional companies have very different reasons (meaning barriers) for not participating in the defense market.

DOD’s third most frequently cited expected benefit to using OTs--flexibility in negotiating terms and conditions--almost always refers specifically to an OT’s ability to give DOD flexibility while negotiating Intellectual Property (IP) rights. [Ref. 6: p. 12] In the eyes of many DOD officials, flexibility in negotiating IP rights is a key determinant to whether DOD can attract non-traditional firms to do business with them or not. For example, an Agreement Officer made the following comment in DOD’s FY 99 OT report to Congress:

Had the Other Transaction Authority not been available, it is doubtful that DOD could have accessed this technology so affordably. This company is extremely cautious about intellectual property rights. A traditional contract that invoked a Bayh-Dole compliant patent term would doubtless have been rejected or unaffordable. [Ref. 41]

Ironically, GAO revealed in their 2000 OT report that DOD Agreement Officers incorporated standard FAR-type IP clauses into OTs more frequently than any other type of clause. [Ref. 6: p. 20] As already mentioned, DOD officials frequently speculate, but ultimately have no quantifiable proof that their flexibility in negotiating IP rights actually attracted non-traditional firms. Additionally, only 20 percent of the researcher's survey respondents identified this issue as the reason why they chose to pursue defense business. One of two possibilities might explain this phenomenon. Either DOD is not utilizing the flexibility that is afforded to them (by incorporating standard FAR-type IP clauses) or DOD's inability to negotiate flexible IP rights is not as significant a barrier to conducting defense business as originally thought. Of course, further research would be required in order to prove this.

As mentioned earlier in this chapter, there already exists much data regarding DOD's views on the benefit of having Section 845 authority. However, there is very little data regarding the OT participants' views of DOD benefits. Survey Question 14 was aimed specifically at gathering data on this issue by asking the non-traditional companies to identify what benefits they thought DOD obtained from the OT-based relationship. The results of this question reveal that 67 percent of the respondents thought DOD benefited by gaining access to better, faster and cheaper technology.

These views fall directly in line with DOD's most often cited benefit and the legislation's most recently published intent. But these data also contradict the quantified results from survey Question 11, which revealed that DOD gained significantly greater access to non-traditional R&D resources in only 33 percent of the cases. Again, this only views the issue from a quantitative perspective and not a qualitative perspective. It is quite possible for DOD to gain better, faster and cheaper technology by accessing only a small percentage of a company's R&D resources. It is the value to DOD of the R&D obtained that is truly important, not the amount.

D. AGREEMENT STRUCTURE

OT agreements are most easily defined by stating what they are not. As cited in Chapter II, OTs are not contracts, grants or cooperative agreements. Therefore, they are not constrained by the traditional statutes and regulations that frame FAR-based contracts. This lack of constraint provides Agreement Officers tremendous freedom and flexibility when they are crafting OTs. Clearly, this flexibility was intended to give Agreement Officers the ability to best tailor the agreement to the situation.

The previous section discussed how DOD officials routinely cited this flexibility as one of the most popular benefits to using the authority. An Agreement Officer was quoted as follows in DOD's FY 2000 OT report to Congress.

Utilizing an OT for this requirement resulted in beneficial results to the Navy in that an IPT environment was created between DOD and industry. Traditional FAR and DFAR clauses and requirements would have restricted contractor flexibility in proceeding under the resultant agreement. [Ref. 41]

DOD officials also commonly stated that their freedom to craft a tailored agreement is what most often gave the Government the ability to attract non-traditional companies to the defense market. In a December 1996 memorandum, DUSD (AT&L) acknowledged that DOD officials would be operating in an unstructured environment when negotiating Section 845 OTs, but also commented that his expectations were for Agreement Officers to incorporate good business sense and appropriate safeguards to protect DOD's interests. [Ref. 6: p. 19]

Despite having flexibility to tailor OT agreements to better address unique project issues, GAO found in their 2000 report on DOD's use of OTs that DOD's agreements used approaches that varied little in most areas. For example, GAO found that regardless of the type of contractor, the agreement's value or the recipient's contribution of financial resources, many of DOD's Section 845 agreements addressed the financial management, termination and dispute processes, IP rights, Government property administration, and subcontractor management areas much like in standard FAR-based contracts. [Ref. 6: p. 19] GAO also highlighted in a 2001 report on OTA that DOD's analysis supporting its selection of OT agreement structures did not address why either the standard contract

provision or a tailored approach was selected, nor did it discuss the anticipated benefits of the structure selected. [Ref. 44: p. 9]

One possible explanation, according to GAO, of DOD's consistent use of standard contract provisions in its agreement structures is that Agreement Officers are too often relying on example OT agreement models to help them formulate their individual agreements. In fact, GAO found in its review of DOD's Section 845 agreements that the basis for many of the agreements was a model developed by DARPA. More specifically, GAO determined that DOD's reliance on this model is what contributed to the uniformity observed in its approaches to OT agreement structure. [Ref. 6: p. 24] DARPA's model, however, was developed for use on its dual-use technology assistance agreements. Consequently, DARPA officials structured the terms and conditions of their model to reflect the unique nature of these situations. [Ref. 6: p. 24] Clearly, DARPA did not intend the model to be used in all cases.

DOD Agreement Officers' reliance on model agreements while crafting their OTs may seem practical, but more than likely led to agreements that were not tailored to address each relationship's unique issues. Section 845 OTA was developed to give DOD a tool to attract high tech companies from all different industries and markets that previously did not participate in defense business. With that in mind, it is not hard to imagine that the kind of companies DOD is trying to attract find different reasons for pursuing new business.

Survey question 16 asked the non-traditional respondents to list areas their company feels are the most important to consider when evaluating whether to pursue a business relationship with a new customer or establish ground in a new market. The idea behind this question was to discover what motivates non-traditional companies to pursue new business. Not surprisingly, the survey respondents gave a variety of different answers to the question. Responses such as profit potential, market potential, retaining IP rights, return on investment, as well as many others were given. Based on these results, it is more than obvious that each company has its own unique requirements that must be met before it pursues new business. Obviously the traditional DOD contracting approach does not satisfy their requirements, or they would've already been operating in the

defense market. Therefore, using a standard approach to structuring OT agreements violates the very spirit of the authority. OTA affords DOD the flexibility to craft business arrangements that are tailored to the unique circumstances of the situation. The non-traditional companies that DOD is trying to attract are already operating in commercial markets and are used to entering into business relationships that satisfy the unique needs of both parties. If DOD is going to entice these companies to pursue defense business, it must learn to capitalize on the flexibility that OTA provides and structure unique business arrangements accordingly.

As previously mentioned, each company responded to question 16 in a variety of ways. There was, however, one common theme amongst them. One hundred percent of the respondents included “the potential for a long-term relationship” (or a derivation thereof) as a major consideration when deciding whether to pursue new business or not. This theme has serious implications for DOD and its use of Section 845 OTs as a viable method for attracting non-traditional companies.

DUSD’s (AT&L) 2000 OT Guide encourages DOD to pursue follow-on competition utilizing fixed-price type traditional contracts after the OT-based relationship is concluded. On the one hand, non-traditional companies are saying that the potential for a long-term relationship must be there in order for them to be encouraged to pursue new business. Additionally, the traditional DOD contracting arrangements more than likely presented significant enough barriers to them entering the defense market, or one could imagine that they would have already been participating in defense business. But on the other hand, DOD is encouraging these companies to compete for follow-on business that more than likely will involve traditional contracts. In order to compete for the follow-on business opportunities, these companies would most likely have to give up many IP rights, which it has already been established they are unwilling to do.

E. SUMMARY

This chapter presented and analyzed various themes regarding DOD’s use of Section 845 OTs as a method for attracting non-traditional companies and accessing their technology resources. Issues were raised concerning the type of non-traditional companies that DOD actually attracted using OTs, the methods used to attract them,

DOD's benefits gained by utilizing OTs and the ways in which DOD Agreement Officers have been structuring the arrangements.

As Chapter II previously discussed, DOD lobbied for OTA so that it could penetrate the world's most advanced defense-untapped commercial markets and gain access to their leading edge technology. Penetrating these markets and accessing the technology is not a "one shot" deal. If the commercial companies that own the world's most advanced technology are going to be enticed to pursue defense business, they must be given the proper incentive. It is no secret that it costs a significant amount of money for a company to operate a defense division. Right now, many non-traditional companies neither need nor want defense business. If OTs are going to accomplish their mission of attracting non-traditional companies, they must be marketed heavily to the untapped markets and to the most advanced companies, be structured appropriately to reflect each relationship's unique requirements and allow for longer term OT-based relationships.

The following and concluding chapter will present conclusions and recommendations, provide answers to the researcher's principal research questions, and suggest areas for further research.

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VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The purpose of this study was to analyze DOD's use of Section 845 OTA with respect to the legislation's intent. This final chapter will provide the researcher's principal conclusions, which are derived from data accumulated and analyzed from a survey that was distributed among non-traditional companies who participated in an OT-based defense business relationship. Chapter VI will also present recommendations based on the principal conclusions, provide answers to the research questions posed in Chapter I and suggest OTA areas for further research.

B. CONCLUSIONS

The data presented in Chapter IV and subsequently analyzed in Chapter V lead this researcher to draw several conclusions. While these conclusions cover a broad range of issues related to DOD's use of Section 845 OTA, they are presented in descending order from macro to micro issues.

#1. There exists a significant amount of confusion within the Federal Government as to what constitutes a non-traditional company.

DOD officials delegated the responsibility for defining the term non-traditional company as it applies to Section 845 OTs to the Director of Defense Procurement (DDP). As stated previously in Chapter IV, DDP defines a non-traditional company according to the following definition:

A business unit that has not, for a period of at least **one year** prior to the date of the OT agreement, entered into or performed on (1) any procurement contract that is subject to full coverage under the cost accounting standards prescribed pursuant to Section 26 of the Office of Federal Procurement Policy Act (41 U.S.C. 422) and the regulations implementing such section; or (2) any other procurement contract in excess of \$500,000 to carry out prototype projects or to perform basic, applied, or advanced research projects for a Federal agency. [Ref. 4: DL1.12]

While it is very clear that DDP intended for this definition to apply to companies that have not participated in any Federal Government markets within the last year, survey data results seem to contradict this fact. Seventy one percent of the survey respondents

indicate they had done business with other Federal Agencies prior to entering into their OT agreement with DOD. However, the researcher submitted surveys only to companies that were classified according to DDP as non-traditional companies. Additionally, Chapter V cited several instances where Agreement Officers referred in a DOD annual report to Congress to their OT's participants as traditional defense suppliers, yet DDP characterized those same suppliers as non-traditional and tracked their participation as such.

Chapter V highlights the fact that in their 2000 report entitled *DOD's Guidance on Using Section 845 Agreements Could be Improved*, GAO raised this issue as well. Specifically, it is pointed out that DOD's Inspector General (DODIG) independently collected non-traditional company participation in Section 845 OT statistics, but defined a non-traditional company as one that had not performed research on cost-based contracts or that had been subject to an audit by the Defense Contract Audit Agency within the past three years. Obviously, this definition represents a dramatically different interpretation of a non-traditional company than DDP's and therefore, would result in dramatically different non-traditional participation rate statistics if it were applied.

#2. Many of the non-traditional companies participating in OT-based relationships with DOD are from markets where significant defense business already exists.

This study's survey respondents were asked to characterize their companies' positions relative to their primary competitors according to the level of DOD business the companies were conducting. One hundred percent of the respondents indicated they were one of several companies within their competitive market that was conducting business with DOD. These results completely contradict the belief that the non-traditional companies DOD is attracting with OTs are coming from untapped industries and markets. Given this fact, one could question whether the technology to which DOD gained access as a result of these OT-based relationships could have been obtained from any of the other companies with which DOD was already doing business in those same markets.

The fact that 100 percent of the survey respondents categorized themselves as one of several companies operating in their competitive market that was doing business with

DOD may not be surprising considering the way that DOD markets its Section 845 OTs. Chapter V pointed out that in several of the comment sections in DOD’s annual report to Congress on its use of OTs, Agreement Officers explicitly stated that they attracted the non-traditional company using a Broad Agency Announcement (BAA) or Commerce Business Daily (CBD) solicitation. It stands to reason that companies operating in predominantly defense markets are going to be reading the “traditional” defense solicitations. Likewise, the companies that are operating in the untapped DOD markets are operating in their own unique circles and probably are not going to be reading publications such as the CBD or noticing BAAs.

A question in the survey’s demographics section asked respondents to approximate their companies’ average annual R&D budget over the last five years. Only 29 percent of the respondents had annual R&D budgets of one million dollars or more. Additionally, the remaining 71 percent had annual internal R&D budgets of under a half million dollars. In terms of today’s high technology dominated industries, these annual R&D budgets represent very small numbers. These facts, combined with the survey results that indicated DOD was attracting companies from markets where significant defense business already exists, provide enough evidence to suggest that OTs are not attracting the right kind of non-traditional companies.

#3. DOD achieved varied success in using OTs to tap into non-traditional R&D resources.

As mentioned numerous times throughout this thesis, DOD’s most frequently stated primary expected benefit from using Section 845 OTA is to give it access to more non-traditional R&D resources. Congress placed it in the legislation’s language. DUSD (AT&L) stated it in its most current OT regulatory document. And, GAO identified it in a 2000 report as DOD’s most often cited expected benefit.

Yet, given all of the publicity that this expected benefit received, DOD has not identified any quantifiable evidence to measure how successful it has been at achieving this benefit. Chapter IV identified and discussed data pertaining to how many non-traditional companies participated with DOD in OT-based relationships. However, data

pertaining to how much of the non-traditional R&D resources were tapped into has never been quantified or tracked.

Chapter V highlighted the fact that DUSD's (AT&L) April 2000 OT Guide established a new requirement for Agreement Officers to track as a metric the involvement of non-traditional contractors that participate to a significant extent in a prototype project administered using an OT. However, this metric is intended only to indicate that a company is non-traditional so that DOD's success rate of attracting non-traditional companies using OTs can be more easily quantified and tracked. Again, this does nothing to address the more important question regarding how much of the non-traditional companies' R&D resources DOD was able to tap into using the OT.

In an effort to actually address this idea, survey question 11 asked the non-traditional respondents to identify the percentage of their companies' R&D efforts that DOD had access to both before and after the OT-based business relationship was formed. Exactly half of the respondents stated that DOD had access to 90 percent of their companies' technology both before and after their participation in the OT agreement. Clearly, the OT had no impact on the amount of non-traditional R&D resources to which DOD had access in these situations. Additionally, only in 33 percent of the cases did DOD have access to a significantly greater amount of the companies' R&D resources after the OT-based relationship was formed. One other interesting fact exists regarding the 50 percent of the cases in which the OT had no impact on DOD's ability to tap into non-traditional R&D resources. Every one of these companies indicated they had participated in business relationships with other Government agencies prior to their OT relationship with DOD. It is quite possible that these companies are only non-traditional by definition, and actually have been operating in the defense market before (just not in the last year).

#4. Every OT-based relationship is unique in that non-traditional companies pursue defense business for very different reasons.

DUSD (AT&L) established a new requirement in FY 2001 for Agreement Officers to track, as a metric, non-traditional company participation in OT-based relationships. Clearly this will provide defense officials statistics as to the participation

rate of non-traditional companies in OT-based relationships. However, the challenge still exists for defense officials to determine if it was the OT that enticed the non-traditional companies to pursue defense business in the first place.

Survey question nine asked respondents to indicate if there were specific provisions in the OT that enabled their participation in a business relationship with DOD. An overwhelming majority (71 percent) answered “yes,” meaning that there were specific provisions in the OT arrangement that enticed them to pursue defense business. Regarding the remaining 29 percent that answered “no,” there might very well be other reasons why those companies chose to pursue defense business. Consequently, one could conclude that these companies might have participated in a relationship with DOD regardless of whether an OT was used or not. The reason why it is so important for DOD to identify these reasons is so that Agreement Officers can better understand what in fact motivates non-traditional companies to pursue defense business, and thus allow them to more frequently include these motivators in their OTs.

Survey question 10 was a follow-on question for those respondents that answered “yes” to the previous question. Question 10 asked the companies which stated there were specific provisions of the OT that enabled their participation in the relationship to identify those provisions. The point of this question was to determine what part of the OTs changed their mind about participating in the defense market. Simply put, this was intended to identify what barriers were overcome as a result of the OT. Given this information, a comparison could then be made between the stated barriers and the most common barriers reported in DOD studies.

Interestingly enough, every company’s answer but two was different. Additionally, the specific answers they provided did not completely match with the most commonly cited barriers to pursuing defense business. As identified in Chapter III, the intellectual property rights clauses found in traditional FAR-type contracts are the Government regulation that companies most frequently cite as their reason for refusing Government R&D contracts. However, only 20 percent of the respondents in this survey identified intellectual property rights clauses as the specific clause that enabled their participation in the OT agreement. Given the diversity in answers, one might be led to

believe that different non-traditional companies have very different reasons for pursuing defense business.

Survey question 16 asked the non-traditional respondents to list areas their company feels are the most important to consider when evaluating whether to pursue a business relationship with a new customer or establish ground in a new market. The idea behind this question was to discover what motivates non-traditional companies to pursue new business. Not surprisingly, the survey respondents gave a variety of answers to the question. Responses such as profit potential, market potential, retaining IP rights, return on investment, as well as many others were given. Based on these results, it is obvious that each company has a set of unique requirements that must be met before it pursues new business. Apparently, the traditional DOD contracting approach does not satisfy the companies' requirements, or they would already have been participating in the defense market prior to their OT agreement. Therefore, using a standard approach to structuring OT agreements violates the spirit of the authority. OTA affords DOD the flexibility to craft business arrangements that are tailored to the unique circumstances of the situation. The non-traditional companies that DOD is trying to attract are already operating in commercial markets and are used to entering into business relationships that satisfy the unique needs of both parties. If DOD is going to entice these companies to pursue defense business, it must learn to capitalize on the flexibility that OTA provides and structure unique business arrangements accordingly.

#5. DOD Agreement Officers are not tailoring OT agreements to match the unique circumstances of each OT-based business relationship.

OT agreements are most easily defined by stating what they are not. As cited in Chapter II, OTs are not contracts, grants or cooperative agreements. Therefore, they are not constrained by the traditional statutes and regulations that frame FAR-based contracts. This lack of constraint provides Agreement Officers tremendous freedom and flexibility when they are crafting OTs. Clearly, this flexibility was intended to give Agreement Officers the ability to best tailor the agreement to the situation.

Despite having flexibility to tailor OT agreements to better address unique project issues, GAO found in their 2000 report on DOD's use of OTs that DOD's agreements

used approaches that varied little in most areas. Chapter V discussed how GAO found that regardless of the type of contractor, the agreement's value or the recipient's contribution of financial resources, many of DOD's Section 845 agreements addressed the financial management, termination and dispute processes, IP rights, Government property administration, and subcontractor management areas much like in standard FAR-based contracts. Chapter V also revealed that DOD's analysis supporting its selection of OT agreement structures did not address why either the standard contract provision or a tailored approach was selected, nor did it discuss the anticipated benefits of the structure selected.

One possible explanation of DOD's consistent use of standard contract provisions in its agreement structures is that Agreement Officers are too often relying on model OT agreements to help them formulate their individual agreements. In fact, Chapter V discussed how DOD used a model developed by DARPA as the basis for many of its agreements and it was DOD's reliance on this model that contributed to the uniformity observed in its approaches to OT agreement structure. Chapter V also noted that DARPA's model was originally developed for use on its dual-use technology assistance agreements. Consequently, DARPA officials structured the terms and conditions of their model to reflect the unique nature of these situations. Clearly, DARPA did not intend its OT model agreement to be utilized in all cases.

C. RECOMMENDATIONS

#1. Develop and apply within the Federal Government a consistent definition of what constitutes a non-traditional company.

Congress requires DOD to report annually on its usage of OTA. Until recently, Agreement Officers' input needed only to answer a few generic questions regarding their lessons learned from the experience and their perspective on the extent to which the OT agreement contributed to a broadening of the Defense Technology and Industrial Base. Considering that OTA is a temporary authority given to the Department, Congress undoubtedly intended to use DOD's annual report to assist them in making a determination whether the authority was living up to its legislative intent (and whether the authority should be extended).

Periodically over the last five years, various DOD and legislative officials tasked other Government organizations to perform independent assessments as to whether DOD's use of Section 845 was living up to its legislative intent or not. Ironically, these organizations encountered difficulty in comparing their results to DOD's. Further research revealed that their difficulties stemmed from the fact that their definition of a non-traditional company varied greatly from DOD's.

If both Congress and DOD desire to appropriately measure the authority's ability to live up to its legislative intent, they must first establish a common means by which to measure. Specifically, this means that those who use the authority, as well as those who monitor its use, must agree on a common definition of a non-traditional company. However, above and beyond the basic need for finding consensus amongst all parties, legislative and DOD officials must develop a definition that appropriately captures the true spirit of the legislation's intent.

#2. Identify the untapped commercial markets and industries that contain the most advanced technologies and aggressively advertise DOD's OTA using commercial-style marketing approaches.

Chapters IV and V provided analysis regarding the types of non-traditional companies DOD attracted with its OTs. Chapter III discussed trends in private industry R&D. The researcher concluded from the survey data that DOD is attracting non-traditional companies from markets where there already exists a significant amount of defense business. Yet discussions in Chapter III imply that the R&D and technology that DOD really needs access to is located in markets and industries that it has not yet tapped.

DOD currently solicits OT participation using the same means it uses to solicit traditional contract business. By using this process, DOD is relying upon the firms that respond to their solicitations. As the survey data results suggest, only non-traditional firms from already accessed defense markets are responding to DOD's solicitations. The non-traditional companies that own a large percentage of the world's most advanced technology are currently operating in "untapped" commercial markets and are more than likely entirely unaware of emerging defense business.

Rather than rely on the companies to come to it, DOD must identify the specific markets and industries in which it wants to establish new ground and aggressively advertise to all participants the flexibility that OTA affords both the Government and the OT participants. Additionally, DOD must identify and use the most appropriate commercial style of advertising for the specific industries or markets it's targeting.

#3. Develop a method for analyzing and tracking DOD's success at using OTs to tap into non-traditional R&D resources.

DUSD (AT&L) recently established a new requirement for DOD Agreement Officers to track the participation of non-traditional companies in their OT agreements. The purpose behind this requirement is to allow DOD to better "answer the mail" when it comes time for it to justify the authority's existence to Congress. Clearly, this new requirement will assist DOD officials in determining how well the authority is living up to the half of its legislative intent which is to attract non-traditional companies to participate in defense business. However, this new requirement offers no help in determining whether the authority is living up to the other half of its legislative intent, which is to provide DOD a tool to access the non-traditional companies' R&D resources. Currently, there is no method established for measuring success in achieving this goal.

In order for DOD officials to truly determine how well OTA is fulfilling its legislative intent, they must first gather all of the relevant facts. One extremely relevant fact is the amount of R&D resources DOD was able to attract during each OT-based relationship. Therefore, DOD officials must develop an appropriate method for measuring the amount of non-traditional R&D/technology accessed and use this information to analyze whether this valuable tool is being used properly or not.

#4. Perform robust market research efforts on the untapped non-traditional markets and industries being targeted by OTA in an effort to determine what will entice those market and industry participants to pursue defense business.

The flexibility OTA affords DOD means nothing unless it is used properly. When using this authority, Agreement Officers have the powerful ability to tailor individual agreements to meet the unique circumstances of that relationship. Many studies have been conducted to identify any barriers that might exist which are preventing non-

traditional companies from pursuing defense business. Chapter IV presented data that suggests that each non-traditional company has its own unique set of barriers that must be overcome before they are encouraged enough to pursue a new market or customer.

An earlier recommendation discussed DOD's need to gain access to the untapped markets that contain the world's most advanced technology. In order to accomplish this, DOD must first understand what motivates the participants in these markets to pursue new business. Armed with this knowledge, Agreement Officers can then aggressively pursue relationships with these participants by offering OT agreements that satisfy their unique requirements.

#5. Educate Agreement Officers on how to develop and tailor “world class” commercial-style business arrangements that best match the unique circumstances of each business relationship.

Chapter V discussed DOD Agreement Officers' tendency to rely on models when crafting their OT structure. OTA was developed in order to give the Department the flexibility to tailor arrangements to match agreements with the unique circumstances of each relationship. Conclusions drawn in earlier sections of this chapter indicate that non-traditional companies require this sort of flexibility in their business arrangements before they are encouraged to pursue new customers. Yet Agreement Officers continue to restrict the flexibility of their agreements by incorporating standard FAR-type contract provisions into their OTs.

Evidence exists to support the conclusion that Agreement Officers are relying too heavily on models when developing agreements. However, almost no evidence exists as to why this is occurring. One possible answer is that Agreement Officers simply are not experienced enough in commercial style business arrangements to know how to appropriately craft one. No tool is worth anything unless it is used properly. If DOD is to truly become a “world class” buyer in the high technology non-traditional markets, Agreement Officers must have the ability to craft “world class” commercial-style business arrangements that accurately match the situation. Training Agreement Officers how to develop an OT agreement according to a model is not the answer in this case.

Rather, Agreement Officers must be educated on commercial-style business operations and must acquire experience at developing them.

D. ANSWERS TO RESEARCH QUESTIONS

This section provides brief answers to the primary and subsidiary thesis research questions posed in Chapter I.

1. To what extent has Other Transaction Authority allowed Department of Defense to attract non-traditional suppliers and tap into their previously unavailable research and development and technology efforts?

DOD and DARPA combined administered 245 new Section 845 OTs from FY 1994 through FY 2000. [Ref. 42] Figure 4, Chapter II, provided the specific breakdown of the number of new Section 845 OTs administered per fiscal year during this same period. According to DUSD's (AT&L) Section 845 OT database, 85 (35 percent) of the 245 new OT agreements involved non-traditional participants. [Ref. 42] These 85 new OT agreements that involved non-traditional company participants were the "fixed pool" of companies to which the researcher targeted the surveys.

DOD has not identified any quantifiable evidence to measure how successful it has been at tapping into non-traditional R&D resources. In an effort to actually address this idea, survey question 11 asked the non-traditional respondents to identify the percentage of their companies' R&D efforts to which DOD had access both before and after the OT-based business relationship was formed. Exactly half of the respondents stated that DOD had access to 90 percent of their companies' technology both before and after their participation in the OT agreement. Clearly, the OT had no impact on the amount of non-traditional R&D resources to which DOD had access in these situations. Additionally, only in 33 percent of the cases did DOD have access to a significantly greater amount of the companies' R&D resources after the OT-based relationship was formed. One other interesting fact exists regarding the 50 percent of the cases in which the OT had no impact on DOD's ability to tap into non-traditional R&D resources. Every one of these companies indicated they had participated in business relationships with other Government agencies prior to their OT relationship with DOD.

2. What is the trend in DOD's investment in R&D over the last decade and how does it compare to private industry's investment trends in R&D?

Chapter III revealed that FY 2001 marked an all time high (in inflation adjusted terms) in total Federal R&D spending over the last quarter century. In 1976, the Government spent less than \$60 billion (in today's adjusted dollars) as compared to the \$85 billion budgeted for FY 2001. While one may guess that there was a smooth upward linear path between these two points, that is far from the case. The relative split between defense and non-defense R&D spending has also changed over the years.

Times have changed significantly since 1976, when a professional science organization christened the first edition of their association magazine with the following opening line: "The Federal Government holds most of the high cards which determine the thrust and priorities of scientific research and development effort in the United States." [Ref. 35: pp. 6-7] Since then, a dramatic shift in the composition of total national R&D spending has occurred. In 1980, private industry first exceeded Federal Government spending on R&D. Since then (with the exception of DOD's peak spending level in 1987), the gap between Government and private spending for R&D continued to grow. In 1999, private industry accounted for 68.5 percent of total U.S. R&D and the Federal share has continued to decline.

3. Why is it important that DOD gain greater access to commercial R&D and technology resources?

In order to ensure our nation's security and remain globally dominant in this new era, DOD must have access to the most superior technology on the planet. As opposed to a decade ago when DOD funded and controlled the most cutting edge technology, today commercial companies operating in commercial markets hold much of the world's superior technology. DOD simply does not have the resources today to fund comparable technology themselves. Consequently, DOD is forced to rely on these commercial markets to satisfy its demand for the rapid insertion of superior technology into weapon systems at an affordable price. Yet studies suggest that significant barriers exist that prevent commercial industry from seeking business with the Government. Therein lies

the dilemma; in order to survive, DOD must tap into the technology held by commercial firms that neither need nor want their business.

4. According to DOD, what are the most commonly perceived barriers to attracting non-traditional suppliers to the Government Acquisition market?

Chapter II described how OTA was developed with the intent of providing DOD the flexibility to negotiate business relationship terms and agreements without the restrictions imposed by traditional FAR clauses. DOD officials and legislators envisioned Section 845 OTA being used to allow firms to conduct business with the Government without changing any of their current practices or processes. Chapter III revealed the fact that companies organize to do business in either the defense sector or the commercial sector, but rarely do both under one administrative roof. Commercial divisions respond to market conditions, whereas the Defense divisions typically respond to military programs and budget cycles. Maintaining such dramatically separate operations is extremely costly and is only done when it makes good business sense.

Chapter III discussed how traditional DOD contracts usually regulate profit in some respect, even when it's a cost-type contract involving heavy R&D. In contrast, most high-technology private industry companies recover their investment in R&D through large profits, then reinvest those profits in the next generation product. Traditional defense contractors, on the other hand, are able to survive on smaller profits because their R&D costs are typically recovered through terms of the contract. In these cases the Government usually owns the data rights so that they can make the data package available to future bidders in an effort to promote future competition. Commercial companies that invest heavily in R&D do not subscribe to this process because they see it as offering their trade secrets to their competition.

Chapter III discussed the fact that the intellectual property rights clauses found in traditional FAR-type contracts are the Government regulation that companies most frequently cite as their reason for refusing Government R&D contracts. As it stands, the Government's rights to hold patents and intellectual property (IP) represent the major barrier preventing commercial companies from performing R&D for the Government. Consequently, many of the world's leading high technology companies bypass DOD

business because traditional DOD contracts prohibit them from using their innovations in future commercial products.

5. How do the non-traditional suppliers who have entered into business arrangements with DOD using Other Transactions perceive OTA as a means for overcoming these barriers?

Survey question nine asked respondents to indicate if there were specific provisions in the OT that enabled their participation in a business relationship with DOD. A large majority (71 percent) answered “yes,” which meant that for these companies there were specific provisions in their OT agreement that encouraged them enough to pursue defense business. Based on this fact, one can conclude that for these companies the OT reduced their barriers to participating in defense business.

On the contrary, 29 percent of the respondents answered “no,” which provide enough grounds to warrant further investigation into whether there were other reasons those companies chose to pursue defense business. If there were, it would imply that these companies would have participated in a relationship with DOD regardless of whether an OT was used or not. Therefore, the OT itself did not reduce any barriers. The reason why it is so important for DOD to identify these reasons is so that Agreement Officers can better understand what in fact motivates non-traditional companies to pursue defense business, and thus allow them to more frequently include these motivators in their OTs.

6. From the non-traditional suppliers’ perspective, what general characteristics would a business arrangement need to contain in order to encourage them to allow DOD greater access to their R&D and technology efforts?

Survey question 16 asked the non-traditional respondents to list areas their company feels are the most important to consider when evaluating whether to pursue a business relationship with a new customer or establish ground in a new market. The idea behind this question was to discover what motivates non-traditional companies to pursue new business. Chapter IV presented the survey respondents’ results and highlighted the fact that each company gave a variety of different answers to the question. Specific responses such as profit potential, market potential, retaining IP rights, return on

investment, as well as many others were given. Even though each company responded to question 16 in a variety of ways, there was one common theme amongst them. One hundred percent of the respondents included “the potential for a long-term relationship” (or a derivation thereof) as a major consideration when deciding whether or not to pursue new business. This theme has serious implications for DOD and its use of Section 845 OTs as a viable method for attracting non-traditional companies.

E. SUGGESTED AREAS FOR FURTHER RESEARCH

This study analyzed issues regarding DOD’s use of Section 845 OTA by soliciting data from non-traditional companies that participated in OT-based relationships with DOD. Furthermore, this study concluded that many of the non-traditional companies with which DOD participated in OT-based relationships came from markets where significant defense business already existed. Consequently, this researcher’s conclusions and recommendations were based on data gathered from companies operating in markets that have already been tapped by DOD. One recommendation is to conduct a similar study that gathered views from highly advanced commercial companies which are operating in markets and industries untapped by DOD with a focus on determining if and how OTA could be used to successfully entice them to pursue defense business.

This study also revealed that DOD Agreement Officers consistently applied standard FAR-type contractual provisions to their OT agreements and in general varied little in approaches to structuring their agreements. Survey data support the conclusion that OT participants pursue defense business for very different reasons. Consequently, Agreement Officers must have the ability to determine what uniquely motivates each of the non-traditional participants they are trying to attract and craft a “world class” business arrangement that appropriately satisfies all parties’ requirements. As a result, this researcher recommends that Agreement Officers be provided with the education to fulfill these weighty responsibilities. But what is appropriate education? A second recommendation is to conduct a study to determine both the type of education that is necessary and a method for DOD to accomplish it.

Finally, survey data results led the researcher to conclude that DOD achieved varied success in its ability to use OTs to access non-traditional R&D resources. DOD officials consistently claim victory in this category. Yet DOD does not keep any quantifiable evidence to validate this claim. DDP's new requirement for tracking non-traditional participation might give DOD officials insight into how successful OTs are at attracting non-traditional participants. However, this requirement will not help to answer the more important question of how much of their research was attracted. Currently no method to measure this has been developed. A third recommendation is to conduct a study on how to gather these data and measure them. Or more simply, conduct research into how DOD might measure whether OTA is really fulfilling its legislative intent.

APPENDIX A – INTRODUCTORY SURVEY LETTER AND QUESTIONNAIRE

Dear Business Partner,

As a Master’s student attending the Naval Postgraduate School, I am conducting thesis research on the Department of Defense’s use of Other Transaction Authority. Since 1994, the Department of Defense (DOD) has had a limited authority to enter into business relationships with private sector companies using agreement vehicles other than standard Government contracts, grants, or cooperative agreements. These agreements, commonly referred to as **Other Transactions (OT)**, are typically used for research and development (R&D) and prototype projects. When DOD uses OTs as a contractual vehicle, they are essentially exempt from adhering to most Federal Government contractual statutes and regulations.

Congress granted this authority to offer DOD greater flexibility in their efforts to leverage robust private industry R&D resources and to help reduce the barriers (as seen from the private sector company’s perspective) to conducting business with the Government. Since given this authority, DOD has attempted to use Other Transactions as a method of attracting companies that for whatever reason would previously not conduct business with the Government. DOD classifies such companies as “Non-Traditional” suppliers.

The focus of my research is to analyze the extent to which Other Transaction Authority has helped DOD in their efforts to attract these “Non-Traditional” suppliers. **According to my research, your organization entered into a business relationship with DOD (between the years 1995 and 2000) using an Other Transaction...and at the time of the agreement, your organization had not conducted any recent business with DOD, thus classifying your organization as a “Non-Traditional” supplier.** I have attached a short online survey that I am asking you to complete. Once you have completed the survey and included any additional comments, just hit the send button. It’s that easy! I have also included a link that will lead you to some background information on Other Transaction Authority if you are interested.

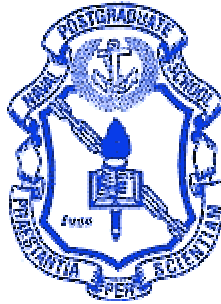
Your organization’s specific comments and survey data will remain entirely anonymous as a source of information in my study. Therefore, you need not identify yourself. Because of your organization’s experience as a participant in an Other Transaction agreement, your opinions are extremely valuable. Please feel free to contact me via e-mail with any questions or comments.

Link to Survey: <http://www.nps.navy.mil/spear/surveys/survey1.htm>

Other Transaction information: <http://www.acq.osd.mil/dp/dsps/ot/otadescription.doc>

Thank you in advance for your time and comments!

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SPEAR

Strategic Planning, Educational Assessment and Research

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Survey of Industry Opinion of Other Transactions

This survey is intended to solicit your ideas and comments regarding the Department of Defense's (DOD) use of Other Transactions (OT) as a method for attracting private industry Research and Development (R&D) and technology. The following questions are specifically targeted towards companies that previously had not conducted business with DOD, but chose to enter into a relationship with the Government for the first time using an OT as the vehicle. Please take a few moments to give us your honest appraisal and comments on DOD's use of OT's.

1. What is your company's primary product or service?

2. What is your company's primary industry?

3. What is your company's approximate current annual sales volume?

- Under \$1,000,000
- \$1,000,000 - \$5,000,000
- \$5,000,000 - \$50,000,000
- \$50,000,000 - \$100,000,000
- Over \$100,000,000

4. What is the approximate average over the last 5 years of your company's annual R&D/technology budget?

5. Was your company's participation in the Other Transaction...

- a one-to-one relationship involving only your company and DOD?
- a part of a consortium of companies participating in the Other Transaction with DOD?
- the result of a prime to sub constructor relationship your company had with another firm that was doing business with DOD?

6. At the time your company participated in the Other Transaction relationship with DOD, how would you characterize your company's position with respect to the primary competitors in your industry?

- The only company amongst our competitive industry that was doing business with DOD.
- One of several companies within our competitive industry that was doing business with DOD.
- The only company within our competitive industry that was not doing business with DOD.

7. Had your company ever done business with any other Federal Government Agency prior to entering into the Other Transaction agreement with DOD?

- Yes

No

8. Please cite the top five reasons why your company did not conduct business with DOD prior to the Other Transaction agreement (e.g., Government audit requirements, technical data rights, restrictions on foreign access to technology, burdensome paperwork, requirement to comply with cost accounting standards, etc.).



9. Were there specific provisions of the Other Transactions agreement that enabled your participation in a business relationship with DOD?

Yes

No

10. If your answer to question #9 was yes, what were those specific provisions? (If answer was "no," proceed to question #11).



11. In your estimation, what percentage of your company's total R&D/technology efforts did DOD have access to (e.g., in the form of the potential for off-the-shelf commercial product purchases) before a business relationship was formed using the Other Transaction agreement? After?



12. Did the business relationship formed by the Other Transactions agreement "open the door" to follow on business with DOD?

Yes

No

13. If your answer to question #12 was "yes," was the follow on business

conducted using...

- traditional Government procurement contracts
- additional Other Transaction agreements
- both traditional Government procurement contracts and Other Transaction agreements

14. In your opinion, what benefits did DOD receive as a result of your company's participation in the Other Transactions agreement (e.g., unique commercial products or processes, better, cheaper or more readily available technology, etc.)?

15. In what ways did the Other Transactions agreement mirror business relationships that your company had with the private industry customers that had the most access to your R&D/technology efforts?

16. What areas does your company feel are the most important to consider when evaluating whether to pursue a business relationship with a new customer and/or establish ground in a new market? (for example, dollar size/profitability of the deal, potential for a long-term relationship, ease of negotiation, protection of technical data rights/proprietary information, ability to allow global access to technology, flexibility of business arrangement, etc.)

Click Here to Send

Return to the [Home Page](#), without sending answers.

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