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Effect of Information and Decision-making on DoD Performance Incentives and Award Fees

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Abstract

This analysis discuses DoD policy for the use of Performance Incentives and Award-fee Contracts during System Development and Demonstration (SDD). Both a review of the use of Performance Incentive Contracts since the 1960s, as well as the current policy required by the DoD to develop performance incentives are provided. A performance incentive should be structured such that the contractor receives a profit for improved performance equal to the value to the government of the improved performance times the cost-sharing ratio. This formula will motivate a contractor to spend no more than the government's value to enhance performance. If exactly that amount is spent, the loss in profit resulting from increased cost will just equal the profit received from enhanced performance. This project also shows how a similar logic can be extended to Award-fee Contracts. The analysis examines alternative decision-making and informational structures to determine the effect on contract outcome when the performance incentives are structured in accordance with policy. In certain situations, more complex incentive structures may be required. However, the informational requirements to properly develop these more complex Incentive Contracts may be substantial.

Introduction

Recently, the General Accounting Office issued a report in which questions were raised about the role of profits in motivating defense contractors (2005). In fact, a RAND 1968 study was cited as evidence for this claim (Fisher, 1968). The GAO report emphasizes that Award Fee pools on a particular contract are "rolled-over" from one evaluation period to the next, which provides the contractor with additional opportunities to obtain higher awards. Typically, concludes the GAO, the final Award Fees that are received tend to be toward the high end of the possible range.

In light of this report, it is appropriate to review the history of incentive contracting to include both the use of objectively measurable performance characteristics and Award-fee Contracts. We focus on the use of these contractual arrangements when costs are shared between the government and the contractor.

This area has not escaped the notice of the academic community, and recently, a number of economists have suggested that the efficiency of the defense procurement process could be enhanced by employing new developments from the economics of information. While these recommendations have not yet been embraced by the procurement policy community, they do represent another area in which economic analysis may contribute to the efficiency of the defense sector. The areas of particular interest to economists include incentive contracting, profit policy, source selection, and negotiation (for example, see Leitzel and Tirole (1993) and Bower and Dertouzos (1994)).

Incentive contracting has probably attracted the greatest attention. Incentive contracts are primarily employed for the development and production of weapons systems. In the situation in which there are only cost incentives in the contract, the defense contractor shares some proportion of the contract costs with the government. Contracts, however, may also include performance incentives in which the profit received by the contractor varies with the performance level of the equipment being developed or procured.

We begin with a brief discussion of the history of performance incentives from the standpoint of usage and policy, and relate these to the new developments in economic analysis. Then, we discuss the approach recommended by policy directives since the 1960s. Given this policy prescription, we show how predicted contract outcomes depend on the model used to describe contractor behavior.

We then turn to Award-fee Contracts and combine performance incentives with an Award Fee. Award-fee contracts are based on the subjective evaluation of the difficult-to-measure characteristic of contractor performance.

Performance Incentives in DoD Contracting and Economics

The government contracted for its first aircraft with the Wright Brothers in July 1909 at a target price of $25,000 and a target aircraft speed of 40 miles per hour. However, for every mile per hour over the target, the contractor would receive an additional $2,500; and for every mile per hour under the target, the contractor would lose $2,500. The minimum required speed under the contract was 36 miles per hour. The speed achieved by the aircraft was 42 miles per hour; therefore, a performance incentive award of $5,000 was received in addition to the target price of $25,000 (Cook et al., 1967, August, p. 1).

Interest in performance incentives, however, greatly increased during the 1960s. The *DoD Incentive Contracting Guide* in 1962 stated:

> Perhaps no other DOD procurement policy offers greater potential rewards than the expanded use of performance incentives in developmental contracts. Properly conceived and applied, these incentives can do more than any other factor to encourage maximum technological progress under a single contractual effort. (p. 30; Sherer, 1964, p. 172)

As a result of this guidance, contracts including performance incentives were widely used by the DoD during the 1960s and 1970s. Interestingly, procurement policy for performance incentives developed by the Department of Defense and NASA in the 1960s (and still in effect today) is based on the assumption of hidden knowledge possessed by the single contractor, not the government.

This example of adverse selection occurs because the contractor knows the non-stochastic relationship between performance, q, and contract cost at the time that trade-offs are made, say, between cost and reliability, but the government does not. In this situation, the reward received for enhanced performance, Δq, should equal the contractor's share of contract costs, s, times the value to the government of the enhanced performance.

There is a simple logic behind this performance reward. During the development process, the maximum the government is willing to let the contractor spend for enhanced performance is the value to the government of the extra performance. The government, therefore, is indifferent between such an expenditure and the extra performance achieved.

Similarly, under this performance-incentive function, if the cost of enhanced performance is less than the value of that performance to the government, the contractor's profit would rise; if the cost is greater than its value to the government, the contractor's profit would fall. The contractor, therefore, is motivated to make the trade-off decisions that are in the interests of the government, even though the government does not know the cost to the contractor of the performance enhancement. This approach was taught in DoD-sponsored procurement courses as early as 1964.[1]

In October 1969, the DoD/NASA *Incentive Contracting Guide* explained that the above method achieves two important objectives, "first, it communicates the Government's objectives to the contractor; second, of greater significance, **it establishes the contractor's profit in direct relationship to the value of combined performance in all areas**" (p. 107, emphasis in original).

As the DoD/NASA *Incentive Contracting Guide* has never been superseded, this policy remains in effect today.

During the 1970s, attention shifted to the determination of the optimal risk-sharing relationship between the contractor and the government. It has been established that when the performance-incentive function is determined in accordance with policy, and when the government doesn't know the cost relationship, the contractor's share of contract costs, s, is the parameter that determines the optimal risk-sharing relationship between the contractor and the government.[2]

However, the early discussions of optimal risk sharing focused on a situation in which there was only hidden knowledge, which has also been called subjective uncertainty. In such situations, the contractor is assumed to maximize accounting profit on the contract. The above analysis of risk sharing using the cost-sharing ratio during was also extended to the case of objective uncertainty, which occurs when there remains contractor uncertainty at the time the performance level is selected. In this situation, the contractor is assumed to maximize the expected utility of accounting profit. This is a different level of uncertainty than that implicit in the policy implications of the DoD/NASA *Incentive Contracting Guide.* Objective uncertainty occurs when the there is cost uncertainty for the contractor (as well as the government) at the time the trade-off decisions are made.

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[1] Case materials using this technique were developed by Harbridge House, Inc., in 1964.

[2] The risk-sharing problem as it relates to performance incentives was analyzed by Hildebrandt and Tyson (1979).

The risk-sharing approach, however, raises an interesting issue. If, as many believe, the government is risk neutral while the contractor is risk averse, then under the assumptions of this analysis, it is optimal for the government to bear all the risk. The optimal sharing ratio, s, therefore, equals zero.

In the late 1970s and during the 1980s, economists addressed this issue by explicitly introducing the contractor's unobservable effort level into the objective function of the contractor. If the government is the principal, and the contractor is the agent, then the agent's economic profit is assumed to equal contractual profit less the implicit cost of effort. Typically, the contractor is assumed to be either risk neutral or risk averse, and maximizes expected economic profit in the former situation and expected utility in the latter.[3]

In addition, the contractor's effort was assumed to represent a hidden action that is not observed by the government, so that moral hazard is present. To address this problem, however, it is necessary for the government to know how this unobservable hidden action affects the contractor's economic profit. There are numerous other informational requirements, which, in total, may prevent this approach from becoming operational.

In fact, while there were extended discussions of the role factors such as effort and extra-contractual considerations play in such contractual relationships, during the late 1960s, the only method of addressing this informational issue was through the use of award-fee contracts. In award-fee contracts, the contractor receives fees that are, in part, based on a subjective assessment of "development efficiency." The term development efficiency represents the many factors that provide an incentive to the contractor not to maximize accounting profit. The term most frequently used is "effort," for which there is an implicit cost to the contractor that is not part of accounting profit, but which affects the contractor's decision-making, and therefore, must be taken into account by the government. These award-fee contracts have remained popular with NASA from the 1960s to the present and recently have been used extensively by the Department of Defense.

DoD Policy Prescription

We now turn to a discussion of the method of structuring an incentive contract with the performance incentives advocated by the DoD. To formalize the DoD prescription, let $B(q-q_T)$ equal the value to the government of the performance level developed relative to some target performance level, q_T; and let $C((q-q_T),\theta)$ equal the cost of performance to the contractor, where θ is an exogenous variable known to the contractor, but not the government, at the time q is selected. The variable θ, therefore, represents the hidden information dimension of the problem.

The objective of the government is to maximize, by choice of q, net social benefits:

(1) Maximize $B(q-q_T) - C((q-q_T),\theta)$

The first order condition for this problem is:

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[3] One of the clearest summaries of the modern approach to incentive contracts is contained in Kreps (1990, pp. 577, 616). Extensive references to the modern approach to incentive contracting are also provided.

(2) $B_q = C_q$,

where the subscript equals the variable with respect to the partial derivative of the function.

Let π_A equal the total accounting profit received by the contractor. This total equals target profit, π_T, plus the performance incentive function, $P(q-q_T)$, less the share of costs borne by the contractor, $s(C-C_T)$, where C_T equals target cost.

If the government sets $P(q-q_T)$ equal to $sB(q-q_T)$ as specified by procurement policy, then the contractor solves, by choice of q:

(3) Maximize $\pi_A = \pi_T + sB(q-q_T) - s[C((q-q_T), \theta) - C_T]$

Equation (2), the first order condition desired by the government, is satisfied when the contractor solves this problem; as a result, the objectives of the government and the contractor are both satisfied. It is quite interesting that in this profit-maximization formulation, the optimal q selected by the government does not depend on s, π_T, or C_T.

An important purpose of this analysis, however, is to consider objective functions that are more general than Equation (3), in order to determine the qualitative nature of the dependence of q on s, and π_T under the assumption that the performance incentive function, $P(q-q_T)$, is structured in accordance with policy.

First, we consider a situation in which unobserved contractor effort affects the contractor's economic profit. Next, we generalize Problem (3), augmented to include the implicit cost-of-effort function, to allow for contractor uncertainty at the time q is selected. For this situation, the contractor maximizes the expected utility of economic profit, and we consider both situations in which unobserved effort alternatively affects and does not affect expected utility. Finally, we give recognition to the fact that the government's program office has a significant amount of information about contractor effect. This information, which may only be available during or at the completion of a contract is used to structure a contract which combines performance incentives, cost sharing and an award fee. These contracts have been called Cost-plus-incentive-fee/Award-fee (CPIF/AF) contracts with multiple incentives.

Contractor Accounting, Cost Certainty and Implicit Cost of Effort

Following the economics of information revolution, economists now routinely assume that a contractor (agent) knows more about its own conditions of production and level of effort than does the government (principal).

While the asymmetric information assumption probably does not hold true nearly as widely as economists would have one believe, it does have great deal of merit when it comes to the myriad trade-off decisions that must be made during weapons system development. Cost-performance trade-offs must be made by design engineers on a day-to-day basis, and government contract administrators—even those who work at the contractor's facility—are unlikely to be familiar with these detailed trade-off opportunities that materialize during the contract. Therefore, it seems reasonable to assume that there is hidden information associated with the contract that is known to the contractor, but not the government. The contractor knows more about the nature of effort and the effect of effort on implicit cost than the government.

With respect to the effort level of contractors, however, the asymmetric information assumption may be false. The contract administrators and members of the program office staff may know as much, if not more, about the effort of contractors than members of the company's leadership. Awarding fees based on a subjective evaluation of the contractor's effort level is permitted in the policy directives, and we return to this issue below.

It is, however, true that is difficult for the government to both quantitatively measure effort and properly specify the relationship between effort and economic profit at the time the contract is awarded. Therefore, we first explore the implications of the assumption that economic profit depends on unobserved effort.

In the previous section, the variable θ represented exogenous factors affecting cost that are unknown to the government but are known to the contractor. In this section, we add the contractor's effort level, e, which generates an implicit cost to the contractor. This variable, like θ, is not observed by the government. Unlike θ, however, e is chosen by the contractor. The implicit cost of effort is represented by the function h(e), where $h_e > 0$. The implicit cost of effort, h(e) is subtracted from the accounting profit identified in Problem (3) to yield economic profit, π.

The effort level also affects the observable contract cost, so the cost function is now expressed as $C(q-q_T, \theta, e)$. We assume that $C_e < 0$, so that increased effort reduces contractor's cost; and C_{qe}. < 0, so that the marginal cost of performance decreases with increased effort.

The problem faced by the contractor is now to choose q and e to so as to solve the following problem:

(4) Maximize $\pi = \pi_T + sB(q-q_T) - s[C(q-q_T), \theta,e) - C_T]- h(e)$.

The first order conditions for this problem are:

(5) $B_q = C_q$, and

(6) $sC_e = h_e$.

While Equation (5) is the government's desired first-order condition with respect to q, the effort level selected would not be that desired by the government.

On the other hand, because h(e) is a social cost, this term should be subtracted from Problem (1), and the government's objective is for the contractor to select effort so that $C_e = h_e$: the marginal cost of increasing effort should equal the marginal implicit cost of effort. Because $C_e < 0$, this effectively states that the marginal benefits of effort should be equated to marginal implicit cost.

This suggests that when effort affects the contracts economic profit, it is no longer appropriate for decision-makers to structure the incentive in the manner stipulated simply by: $P(q-q_T) = sB(q-q_T)$. It is important, therefore, to be able to test whether contractor decision-making is affected by the disutility of effort.

It is clear from Equations (5) and (6) that the optimal q does not does not depend on π_T or C_T. However, the sharing rate, s, enters Equation (6), so we must determine how the optimal performance level q* depends on s. Setting the total derivatives of Equations (5) and (6) with respect to q*, e*, and s equal to zero, and solving for dq*/ds and de*/ds yields:

$$(7) \quad dq^{*}\Big/ds = \frac{C_{qe}C_{e}}{|H|} > 0$$

$$(8) \quad de^{*}/ds = \frac{C_{e}\left[B_{qq}-C_{qq}\right]}{|H|} > 0.$$

Because of the second-order conditions, the bordered Hessian, |H| is greater than zero under our assumption that $C_{qe} < 0$and $C_{e}. < 0$, dq* /ds > 0, as indicated by Equation (7). We can also derive the fact that de*/ds > 0 because the second-order conditions require that $B_{qq} - C_{qq} < 0$.

Therefore, when the performance-incentive function is specified in accordance with policy (and the unobserved effort results in contractor disutility), optimal performance, from the standpoint of the contractor, increases with the sharing rate. It may be suggestive to say that higher cost sharing by the contractor induces greater effort, which reduces the marginal cost of performance. Given the specified marginal benefit function, the performance level selected increases.

Contractor Accounting Cost Uncertainty and Implicit Cost of Effort

We turn now to an analysis of contractor decision-making under uncertainty. At the time the contractor picks q and e, a random variable y determines the level of cost that actually occurs. In other words, the contractor can select a performance and effort level with certainty, but the resources that must be applied to achieve the q selected with effort level e are uncertain.

The contractor's cost function becomes $C(q-q_T,\theta,e,y)$, where the random variable y has a known distribution. We assume $C_y > 0$ and $C_{qy} > 0$, so both total cost and the marginal cost of performance increase with the value of y that emerges, when the other arguments of the function are held constant.

It might be helpful to restate the meaning of "θ," "e," and "y." The variable, θ, represents exogenous factors that are known to the contractor but not the government (hidden information or subjective uncertainty); the variable, e, represents the effort level selected by the contractor but unobserved by the government (hidden action); and the variable, y, is a random variable representing the uncertain effect of q and e on contractor cost, given that "θ" is known to the contractor (objective uncertainty).

Also, while economic profit, π, continues to be defined in the manner described above, the contractor now maximizes the expected utility of economic profits, EU(π), where U is a von Neumann-Morgenstern utility function. The contractor, therefore, computes the expected value over the random variable y, and chooses q and e to solve:

(9) Maximize $W = EU\{\pi_T + sB(q-q_T) - s[C(q-q_T), \theta, y) - C_T] - h(e))\}$

For this problem, we obtain the following first-order conditions:

(10) E{U' (.) [sBq - sCq] } = 0

(11) E{U'(.)[-sCe- he]} = 0,

where U'(.) equal the partial derivative of U with respect to π. This partial derivative is evaluated at the optimal level of economic profit, π*. It is important to appreciate that everything inside the brackets, {}, is inside the expectation operator. We also use ( ) to represent the arguments of a function, and [ ] to contain terms that multiply other terms inside the expectation operator. From Problem (9), we see that π* depends directly on s, π_T, and C_T, which are parameters to the contractor but variables determined by the government.

Unfortunately, we have been unable to sign dq*/ds, or $dq^*/d\pi_T$, or dq^*/dC_T when the general Problem (9) applies. We can however, see from the objective function that $dq^*/dC_T = dq^*/d\pi_T$. A dollar of target profit and the contractor's share of target cost are perfect substitutes in the calculation of economic profit. To proceed further, we simplify Problem (9) by assuming that there is no implicit cost associated with effort—i.e., h(e) = 0.

Contractor Cost Uncertainty without Implicit Cost of Effort

The contractor's problem is to compute the expected value of utility over y and choose q to solve:

(12) Maximize $W = EU\{\pi_T + sB(q-q_T) - s[C(q-q_T), \theta, y) - C_T])\}$,

yielding the single first-order condition:

(13) $E(U'(.)[sBq - sCq]) = 0$.

Equation (13) differs from Equation (10) because now economic profit does not depend on the effort of the contractor. With a single first-order condition, we can use the rule for taking the derivative of an implicit function to calculate the comparative statics derivatives:

(14a) $dq^*/ds = -Wqs/Wqq$

(14b) $dq^*/dC_T = - W\pi_T/Wqq$

(14c) $dq^*/dC_T = -Wqc_T/Wqq$,

where the second-order condition ensures that $Wqq < 0$.

Tackling Equation (14a) first, we obtain

(15) $Wqs = E\{U'(.)[Bq - Cq]\} + E\{U''(.)[Bq - Cq][B - C + C_T]\}$

The first term on the right-hand side of Equation (15) equals zero because of the first-order condition. However, we are unable to sign the second term without making further assumptions.

Turning to Equation (14b), we obtain

(16) $Wq\pi_T = E\{U''(.) [Bq - Cq]\}$.

To sign Wqs_T, we use Pratt' s absolute measure of risk aversion, r, where

(17) $r(.) = -U''(,)/U(,)$

Substituting for U"(.), using Equation (17) we obtain

(18) $W_{q\pi_T} = -E\{r(.)U'(.) \quad [B_q - C_q]\}$.

If r is constant, then Equation (18) reduces to the first-order condition and $W_{q\pi_T} = 0$, implying that $dq^*/d\pi_T = 0$.

Similarly,

(19) $W_{qc_T} = -sE\{r(.)U'(\bullet) \quad [B_q - C_q]\}$.

Under constant absolute risk aversion, $dq^*/dC_T = sdq^*/d\pi_T$. Otherwise, the sign of dq^*/dC_T is indeterminate.

Award Fees and Performance Incentives with Observable Effort

Thus far, we have focused on the implications of employing government policy when the objective function of contractors is more complex than the basic policy assumes. We have not presented the optimal incentive structures that might be employed in these situations. The optimal incentive structure has only been provided for the model in which the contractor maximizes contract profit, and at the time cost versus performance trade-offs are made, the contractor has no uncertainty associated with the nature of these trade-offs. The contractor is much better informed about these trade-offs than the members of the program office. We will continue to employ this model, which will be augmented with an Award-fee Incentive. Award-fee Incentives are based on a subjective evaluation of some aspect of the contractor's behavior that it is difficult to measure. While we will continue to employ the term *effort*, the performance characteristic being evaluated should be viewed more broadly. For example, it might be some characteristic of the efficiency with which engineering development is conducted.

In this part of the analysis, we assume that contractors maximize economic profit, π, equal to accounting profit, π_A, minus the implicit cost (or disutility) of effort, h(e). Therefore, the contractor maximizes economic profit: $\pi = \pi_A - h(e)$.

We now assume that government personnel in the program office and those who work in the contractor's plant possess a great deal of information about the contractor's effort and the disutility of this effort. We assume, therefore, that the government has a firm understanding of the function, h(e), by the time the Award Fee is granted. Furthermore, we view these implicit costs as social costs that the government must take into account.

However, we continue to assume that there is an observation horizon below which the government does not have a great deal of information about the contractor's behavior. For example, we continue to assume that detailed trade-off information available to the contractor's engineers is not known.

In contrast to Equation (1), the government now selects q and the now-observable e to solve the following problem:

(20) Maximize $B(q-q_T) - C((q-q_{T,}\ e), \theta) - h(e)$.

The government's first-order conditions for the Award-fee Contract follow:

(21a) $B_q = C_q$

(21b) $-C_e = h_e$

The contractor is given a performance incentive in the form $P(q - q_T)$, and the cost-sharing ratio equals s. In addition, the contractor is now given an Award Fee in the form A(e), where (as indicated) *effort* is measurable by the government. To maximize economic profit, the contractor selects q and e to solve the following problem:

(22) Max $\pi = \pi_T + P(q - q_T) – s(C(q\text{-}q_{T,} e) - C_T) + A(e) – h(e)$,

and the following first-order conditions are obtained:

(23a) $P_q = sC_q$

(23b) $A_e – sC_e = h_e$

With respect to q, the same condition of contractor cost certainty at the time of cost-performance trade-offs that applies in the performance-incentive model continues to hold. Comparing Equations (21a) and (23a), we see that the performance incentive should be set so $sB_q = P_q$. Again, the extra reward for additional performance provided should equal the contractor's share of the benefits to the government from the additional performance. Then, the contractor will be motivated to spend no more than sB_q for the associated incremental improvement in performance. By spending this amount, the contractor will reduce economic profit by sC_q, and both the government and the contractor will break even. If expenditure less than this can achieve the additional performance, both the government and the contractor are better off.

If we compare Equations (21b) and (23b), we see that the following condition holds:

(24) $A_e = (1 – s)h_e$

The incremental award fee should equal the government's share of the incremental cost of effort. Equation (21b) shows that the contractor is compensated for the reduction in cost that results from additional effort. Therefore, the remaining compensation required is shown in Equation (24). One obtains the government's desired result shown in Equation (21b).

The achievement of this condition will not be affected by a change in the cost-sharing ratio. As this ratio changes, Equation (24) indicates that the structure of the Award Fee will change correspondingly.

Nor are any of the first-order conditions affected by π_T or C_T. The objectives of the government and the contractor are both achieved.

Comparative Statics Summary

It is helpful to summarize the summary of our findings for the various models addressed. Models A through F assume that the contract is structured based on existing policy, and Model F addresses a model that is employs both performance incentives and Award Fees.

MODEL	CONTRACTOR CHARACTERISTICS
A	Cost certainty during trade-offs and no implicit effort cost
B	Cost certainty and unobservable effort cost
C	Cost uncertainty and unobservable effort cost
D	Cost uncertainty and no implicit effort cost
E	Cost uncertainty, constant absolute risk aversion, and no implicit effort cost
F	Cost certainty during trade-offs and observable effort and effort cost

For these models, we examined the comparative static derivatives: dq^*/ds, $dq^*/d\pi_T$, dq^*/dC_T. The following table summarizes the findings:

MODEL/SIGNS	dq^*/ds	$dq^*/d\pi_T$	dq^*/C_T
A	0	0	0
B	+	0	0
C	?	?	? (= $sdq^*/d\pi_T$)
D	?	?	? (= $sdq^*/ d\pi_T$)
E	?	0	0
F	0	0	0

While many of the derivative signs remain ambiguous, several results are obtained. We turn now to the informational requirements associated with each of the models discussed.

Conclusions

This analysis has focused on the relationship between the DoD policy prescription in the use of performance incentives and the decision-making process of the government and contractor. The policy rule discussed above—that states that a performance incentive fee should equal the contractor's cost-sharing ratio times the value to the government of the enhanced performance—is applicable when cost uncertainty is eliminated at the time the contractor chooses the cost versus performance trade-offs and there is no implicit cost of effort (Model A). If there is an implicit cost associated with effort, and this contractor behavior is observed by the government, then an Award Fee can be structured that meets the objectives of the government (Model F).

Other informational situations may result in behavior that does not meet the government's objectives. While optimal incentive contracts can be constructed for these alternative situations (Models B through E), the information requirements may be quite demanding and the resulting incentive arrangements quite complex.

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Acquisition Management

- Acquiring Combat Capability via Public-Private Partnerships (PPPs)
- BCA: Contractor vs. Organic Growth
- Defense Industry Consolidation
- EU-US Defense Industrial Relationships
- Knowledge Value Added (KVA) + Real Options (RO) Applied to Shipyard Planning Processes
- Managing Services Supply Chain
- MOSA Contracting Implications
- Portfolio Optimization via KVA + RO
- Private Military Sector
- Software Requirements for OA
- Spiral Development
- Strategy for Defense Acquisition Research
- The Software, Hardware Asset Reuse Enterprise (SHARE) repository

Contract Management

- Commodity Sourcing Strategies
- Contracting Government Procurement Functions
- Contractors in 21st Century Combat Zone
- Joint Contingency Contracting
- Model for Optimizing Contingency Contracting Planning and Execution
- Navy Contract Writing Guide
- Past Performance in Source Selection
- Strategic Contingency Contracting
- Transforming DoD Contract Closeout
- USAF Energy Savings Performance Contracts
- USAF IT Commodity Council
- USMC Contingency Contracting

Financial Management

- Acquisitions via leasing: MPS case
- Budget Scoring
- Budgeting for Capabilities-based Planning
- Capital Budgeting for DoD

- Energy Saving Contracts/DoD Mobile Assets
- Financing DoD Budget via PPPs
- Lessons from Private Sector Capital Budgeting for DoD Acquisition Budgeting Reform
- PPPs and Government Financing
- ROI of Information Warfare Systems
- Special Termination Liability in MDAPs
- Strategic Sourcing
- Transaction Cost Economics (TCE) to Improve Cost Estimates

Human Resources

- Indefinite Reenlistment
- Individual Augmentation
- Learning Management Systems
- Moral Conduct Waivers and First-tem Attrition
- Retention
- The Navy's Selective Reenlistment Bonus (SRB) Management System
- Tuition Assistance

Logistics Management

- Analysis of LAV Depot Maintenance
- Army LOG MOD
- ASDS Product Support Analysis
- Cold-chain Logistics
- Contractors Supporting Military Operations
- Diffusion/Variability on Vendor Performance Evaluation
- Evolutionary Acquisition
- Lean Six Sigma to Reduce Costs and Improve Readiness
- Naval Aviation Maintenance and Process Improvement (2)
- Optimizing CIWS Lifecycle Support (LCS)
- Outsourcing the Pearl Harbor MK-48 Intermediate Maintenance Activity
- Pallet Management System
- PBL (4)
- Privatization-NOSL/NAWCI
- RFID (6)
- Risk Analysis for Performance-based Logistics
- R-TOC Aegis Microwave Power Tubes

- Sense-and-Respond Logistics Network
- Strategic Sourcing

Program Management

- Building Collaborative Capacity
- Business Process Reengineering (BPR) for LCS Mission Module Acquisition
- Collaborative IT Tools Leveraging Competence
- Contractor vs. Organic Support
- Knowledge, Responsibilities and Decision Rights in MDAPs
- KVA Applied to Aegis and SSDS
- Managing the Service Supply Chain
- Measuring Uncertainty in Earned Value
- Organizational Modeling and Simulation
- Public-Private Partnership
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