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A Study of Financial and Non-financial Incentives for Civilian and Military Program Managers for Major Defense Acquisition Programs

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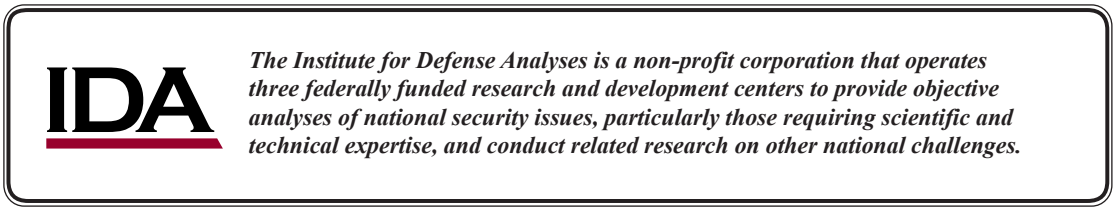

About this Publication
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Executive Summary

The Institute for Defense Analyses (IDA) was asked to conduct a congressionally mandated comprehensive study of financial and non-financial incentives for civilian and military program managers (PMs) for major defense acquisition programs (MDAPs). Specifically, IDA was asked to examine and assess additional pay options for PMs to provide incentives to senior civilian employees and military officers to accept and remain in PM roles, a financial incentive structure to reward PMs for delivering capabilities on budget and on time, and a comparison between financial and non-financial incentive structures for PMs in the Department of Defense (DoD) and an appropriate comparison group of private industry companies.

IDA took a multi-faceted approach to this assessment, including conducting numerous interviews, reviewing the extensive collection of existing literature, and collecting and analyzing data on past PMs. Our main findings are described below.

Additional Pay Options to Provide Incentives to Senior Civilian Employees and Military Officers to Accept and Remain in Program Manager Roles

Senior Civilian Employees

Government civilians, like their military counterparts, are motivated by challenging work, a sense of accomplishment, and career-enhancing opportunities. Financial rewards have been found to be low on the priority list for public employees. However, our analysis showed that average compensation for DoD civilian PMs is significantly lower than for similar military PMs and those in private industry. Establishing a separate, higher pay scale for civilians who have chosen the Program Management career track could incentivize more and higher quality civilians to pursue such careers. Some efforts in this direction have already been made. AcqDemo, introduced in 1999, established an alternative personnel system for qualifying civilian acquisition workforce employees. Expanding AcqDemo further and/or making it permanent would almost certainly enhance future recruiting and retention.

One of the largest non-financial changes that could be made to encourage future civilian PMs is Component Acquisition Executive slating of more MDAP PM positions to civilians and a gradual lessening of the perception that civilians do not have much of a chance of being selected. Presently, civilians may be unmotivated to pursue a career

leading to an MDAP PM position if they see little chance of ever being selected and see no future career path in the rare event that they are.

The ability to have more control over planning one's career path would be another important non-financial incentive for civilians in program management and acquisition. Currently, qualified civilians may shy away from applying for MDAP PM positions due to uncertainty about the location and responsibility of their subsequent assignments.

Military Officers

Given existing constraints on the military pay system, the primary financial incentive available to the uniformed services is special and incentive pay. The literature on financial incentives for military personnel is mixed, but the consensus has been that financial incentives are less effective in the public sector—including in the military—than in private industry.

Currently, the strongest incentives for military officers are related to the promotion process. Failure to be promoted not only reduces current salary and eventual retirement pension, but also can curtail a career due to the "up-or-out" provisions of the Defense Officer Personnel Management Act (DOPMA). As a result, factors that affect potential for promotion have a strong influence on choices made by military officers. The current DOPMA mandates might be considered major disincentives and, as noted in several previous studies, eliminating or modifying both up-or-out and mandatory retirement at 30 years of service could help the Department recruit and retain more skilled and experienced PMs. These changes would also enable more flexible career paths, allowing for fewer (but longer) assignments over the course of a career.

As with civilians, developing better-defined career tracks for PMs could be an important non-financial incentive for attracting military officers. One particular alternative would be to establish a more self-contained professional system for recruiting military officers into the acquisition field, similar to that used for the medical field. This would more closely mirror best practices from industry.

A Financial Incentive Structure to Reward Program Managers

It has been suggested that merit-based incentives (rewards) are the best mechanism for motivating PMs to manage their programs effectively and efficiently. As an example, PMs who meet certain cost and schedule targets could be offered spot bonuses—or even commendations and/or medals. High-performing PMs could be rewarded with more control over their next assignments, especially if the DOPMA up-or-out policy and mandatory retirement do not interfere. While the Congress is seeking ways to reward PMs who deliver capabilities on budget and on time, recognizing the challenge of accurately

measuring PM performance is particularly important because of the dangers of establishing rewards for performance that do not ultimately align with the organization's mission.

Performance-based rewards can have significant unintended consequences when they are applied in the wrong context. Research has shown repeatedly that poorly specified reward systems can create perverse incentives—incentivizing workers to focus on obtaining the rewards rather than on achieving organizational objectives. A rewards system focused on cost and schedule may encourage short-term optimization at the expense of the long-run success of the program. For example, PMs may be incentivized to accept greatly increased future sustainment cost and obsolescence risk in order to avoid missing milestones or having to report cost growth.

A Comparison with Incentives in Private Industry

Although sharing the same title, PMs in government do not have the duties historically associated with the title of "manager" because DoD does not develop or produce its weapon systems in-house. Rather, the development and production work is contracted through prime contractors. The principal functions of the government PM and staff are planning, contracting, monitoring, controlling, and evaluating the schedule, cost, and technical performance of contractors and the government agencies that provide services and support.

Past research finds that public sector managers are often attracted to their work by different factors than private sector managers. Extrinsic motivation factors (e.g., salary, pension plans, and career advancement) have significantly greater potential for motivating private managers, while intrinsic rewards (e.g., challenging and interesting work, job responsibility, advancement/promotion in a hierarchical organization, family-friendly policies, commitment to the public interest, a desire to serve others, self-sacrifice, and recognition) have higher potential for motivating public managers. These differences suggest that different systems of rewards and incentives than those found in the private sector might be best suited to recruit and retain quality government PMs.

For-profit companies have the option to motivate their PMs to achieve organizational objectives by rewarding them with a portion of company profits. Industry PMs who carefully manage successful programs and quickly shut down poor programs that are destined to fail can share in the higher profits their actions bring their companies. The industry PMs who fail may lose their jobs. In contrast, there are no company profits to share with DoD PMs, and acquisition personnel are not subject to the threat of dismissal from the Service on failure as the industry counterpart is. As a result, success tends to be measured in terms of cost and schedule and avoiding cancellation.

Concluding Thoughts

We have focused our efforts in this research on the consideration of the pros and cons of potential incentives to recruit, retain, and reward PMs. We find, as with previous research, only weak evidence that financial incentives would have any impact on the actual tenures of PMs. Moreover, past research finds little support for the implicit assumption that increased PM tenure would have a significantly positive effect on program outcomes such as cost and schedule.

If the real goal is to improve program outcomes, there are likely to be more effective mechanisms than simply increasing the tenure of PMs. For example, DoD could pursue an acquisition centered around "smart buyers." Credible "smart buyers"—such as highly-experienced senior PEOs and PMs—could provide the counterweight that helps to overcome the institutional and political pressures to overpromise at the outset of programs. They further could help to enforce realism in executing programs in the face of contractor optimism. A career progression model, with strong rewards for successful careers, could create the "smart buyer" culture needed to properly develop and incentivize PMs and PEOs to serve as counterweights to political and institutional pressures. Because of their experience, and the career incentive structure, senior acquisition personnel would be positioned to make proper decisions based upon real experience.

Industry experience has shown that another important best practice for maintaining a healthy portfolio is to identify and quickly terminate programs that are unlikely to succeed. Creating policies and a culture that supports failing quickly would be a substantial challenge, but the payoff to the overall outcomes of the entire MDAP portfolio would be considerable.

Contents

1. Introduction

A. Motivation

Section 841(b)(1) of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2018 requires the Secretary of Defense to enter into a contract with an independent research entity to carry out a comprehensive study of financial and non-financial incentives for civilian and military program managers (PMs) for major defense acquisition programs (MDAPs). The Institute for Defense Analyses (IDA) was asked by the Office of the Secretary of Defense (Acquisition) (OSD(A)) to conduct this independent and comprehensive congressionally mandated research.

Specifically, the Congress defined three incentives of interest as:

- Additional pay options for PMs to provide incentives to senior civilian employees and military officers to accept and remain in PM roles,
- A financial incentive structure to reward PMs for delivering capabilities on budget and on time, and
- A comparison between financial and non-financial incentive structures for PMs in the Department of Defense (DoD) and an appropriate comparison group of private industry companies.

B. Methodology

We began our work by conducting a close examination of relevant previous research, as improving incentives for PMs in DoD is not by itself a new idea. In fact, this general topic has been a focus for a plethora of previous studies. This review effort highlights what has been recommended before and the results of those recommendations. It also enabled us to focus our efforts on the current challenges for program management in DoD.

Much of the information obtained by the IDA team was obtained via surveys, structured interviews, and/or discussions with stakeholders and subject matter experts from both the government and private industry. From the government side, our interviews included separate meetings with the Director of Acquisition Career Management (DACM) for each of the Services and several current and former DoD PMs. From industry, we interviewed and/or surveyed representatives from defense contractors (e.g., General Dynamics, Lockheed Martin) as well as some non-defense contractors experienced with program management (e.g., MGM Resorts International, Matworks, Nevada Automotive Test Center, and McKissak & McKissak).

We collected and analyzed data on the military and civilian program management workforce. We also collected data from several sources on the acquisition workforce, PMs specifically, as well as characteristics of MDAPs, to help identify both existing incentives and candidate incentive policy alternatives for recruiting, retaining, and rewarding PMs.

We then identified a set of incentives for assessment. This list of incentives was drawn from our literature review, standard economic theory, our interviews with government personnel, and best practices in industry. Our assessment considered the likely benefits from new incentive policies as well as any side effects or unintended consequences.

C. Roadmap

The final report of this project is organized as follows. Chapter 2 provides an overview of the DoD acquisition career path with a specific focus on current incentives for PMs. Chapter 3 describes our findings and insights from assessing current and historical data on DoD program management. Chapter 4 contains the highlights from our review of the extensive amount of previous relevant literature. In Chapter 5, we describe program management in industry. In Chapter 6, we present and assess incentives to recruit, retain, and reward DoD PMs. We wrap up in Chapter 7 with some concluding thoughts.

2. Acquisition Career Overview

A. Career Overview

A DoD PM generally "manages" multiple interrelated projects. J. Ronald Fox,[1] among others, points out that the duties of DoD managers of large acquisition programs are not those classically associated with the term "manager" because DoD does not develop or produce its weapons systems in-house; rather, the development and production work is contracted through prime contractors. The principal functions of PMs and their staffs are planning, contracting, monitoring, controlling, and evaluating the schedule, cost, and technical performance of the contractors and government agencies that provide services and support.

The Congress, as a matter of policy, has mandated that "appropriate career paths for civilian and military personnel who wish to pursue careers in acquisition are identified in terms of the education, training, experience, and assignments necessary for career progression of civilians and members of the armed forces to the most senior acquisition positions."[2] Military personnel are not given exclusive access to senior acquisition positions, including PM positions. The Congress has provided:

> The Secretary shall establish a policy permitting a particular acquisition position to be specified as available only to members of the armed forces if a determination is made, under criteria specified in the policy, that a member of the armed forces is required for that position by law, is essential for performance of the duties of the position, or is necessary for another compelling reason.[3]

Each Military Department is required "to establish policies and issue guidance to ensure the proper development, assignment, and employment of members of the armed forces in the acquisition field" to ensure as a minimum the following:

- "A single-track career path in the acquisition field that attracts the highest quality officers and enlisted personnel
- A dual-track career path that attracts the highest quality officers and enlisted personnel and allows them to gain experience in and receive credit for a primary

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1 J. Ronald Fox, *Defense Acquisition Reform, 1960–2009: An Elusive Goal* (Washington, DC: Center of Military History, United States Army, 2011), 194.

2 10 U.S. Code (U.S.C.) §1722(a).

3 10 U.S.C. §1722(b)(2)(A).

career in combat arms and a functional secondary career in the acquisition field in order to more closely align the military operational, requirements, and acquisition workforces of each armed force

- A number of command positions and senior noncommissioned officer positions, including acquisition billets reserved for general officers and flag officers under subsection (c), sufficient to ensure that members of the armed forces have opportunities for promotion and advancement in the acquisition field
- A number of qualified, trained members of the armed forces eligible for and active in the acquisition field sufficient to ensure the optimum management of the acquisition functions of the Department of Defense and the appropriate use of military personnel in contingency contracting."[4]

While there are important differences in how the Military Departments have chosen to implement these directives, the passage of the Defense Acquisition Workforce Improvement Act (DAWIA)[5] and subsequent amendments has ensured that the basic structure of military acquisition workforce careers is the same across DoD. Military officers elect to enter the acquisition workforce after 6–7 years of service, joining an acquisition-related career field. Program management is one such career field. After completing certain mandatory training requirements and time in acquisition-related positions, they are eligible to join the Acquisition Corps, typically at a rank of O-4.[6] While in theory these officers compete for promotion with the general pool of officers, in practice all three Departments monitor the proportion of officers promoted to ensure that promotion rates within the Acquisition Corps are comparable to those in operational command tracks. Promotion reviews occur every three years; promoted officers are transferred to new duties commensurate with their new ranks. Officers passed over for retirement in two successive reviews are retired from the Service.

Congress has pushed back in recent years against having all military acquisition career paths feature a one-time permanent transition into the acquisition workforce. Section 842 of the NDAA for FY 2016 added the language quoted above that distinguishes single-track from dual-track acquisition careers. The House report on this bill characterized this

4 10 U.S.C. §1722a(b).

5 10 U.S.C. Chapter 87.

6 Government Accountability Office (GAO), "Defense Acquisition Workforce: Opportunities Exist to Improve Practices for Developing Program Managers," GAO-18-217 (Washington, DC: GAO, February 2018), https://www.gao.gov/assets/700/690094.pdf. GAO notes that the Air Force typically identifies future Acquisition Corps officers earlier in their careers, and tailors their early career assignments toward that goal in ways that the Army and Navy do not.

section as "reinstituting a dual-tracking system of primary and functional secondary career fields."[7] The Senate report said:

> This provision is designed to increase the attractiveness of acquisition functions to skilled military officers and enlisted personnel and would: (1) provide for credit for joint duty assignments for acquisition related assignments in order to broaden the promotion preference and career opportunities of military acquisition professionals; (2) provide for an enhanced dual track career path in combat arms and a functional secondary career in acquisition to more closely align military operational requirements and acquisition; (3) include business and commercial training as joint professional military education; and (4) require an annual report to Congress on promotion rates for officers in acquisition positions.[8]

While it is not explicitly stated in the statute or the conference reports, it seems likely that the intent of the Congress was to re-establish career paths that move back and forth multiple times between acquisition and combat arms assignments. This is not current practice within any of the Military Departments.

Civilians in all Services are managed and promoted within civilian workforce management systems common across DoD. The vast majority of these civilians fall within the General Schedule for federal employees or the Acquisition Workforce Demonstration Project (AcqDemo), which is discussed in more detail below. DAWIA sets requirements for certification, including education and years of experience, for either civilians or uniformed personnel occupying PM positions. It is DoD policy that anyone occupying a key leadership position, as an ACAT I or IA PM, must be Level III-certified in their respective functional area, and they must have eight years of acquisition experience or equivalent demonstrated proficiency. ACAT II PMs and deputy PMs must have six years of acquisition experience.[9]

Various commenters have opined that materiel acquisition and the obligation of taxpayer dollars is not a job that should be relegated to amateurs or part-time performers. Fox (2011) expresses that sentiment as follows:

> After fifty years, we know that an Army or Air Force colonel or Navy captain (at the rank of O–6) with limited industrial management knowledge and experience is often ill prepared to direct and oversee a first-of-a-kind, multi-hundred-million-dollar industrial program with hundreds of complex challenges and dilemmas… There is too much at stake for on-the-job

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7 House Report 114-201 to accompany H. R. 1735, as it was reported out of the House Armed Services Committee.

8 Senate Report 114-49 to accompany S. 1376, as it was reported out of the Senate Armed Services Committee.

9 Under Secretary of Defense (Acquisition, Technology and Logistics), "Key Leadership Positions and Qualification Criteria," Memorandum, November 8, 2013.

> training in these positions. Too often, the training and experience have been far too shallow and brief… Experience to date indicates that managing taxpayer funded acquisition programs costing hundreds of millions of dollars is too important and too complex to be conducted by government military and civilian personnel with part-time acquisition careers or acquisition careers so short as to require incumbents to look to their contractors for their next employment or for a referral for the next employment.[10]

1. Military Officer Career Progression

The Defense Officer Personnel Management Act (DOPMA)[11] was enacted in 1980 and mandates:

1. Mandatory retirement for an O-6, the grade at which most PMs serve, at 30 years;
2. A period of less than 4 years between the time of promotion to O-6 and the trigger to mandatory retirement—at 26 years of service, the officer will either be promoted to O-7 or will have been passed over twice—at which point the O-6 will no longer be eligible for promotion or for selection to be a PM; and
3. Two-time pass-over rules that are an up-or-out trigger, to maintain a youthful officer corps.[12]

DOPMA also limits the amount of time an officer can remain in a particular grade. This necessarily limits the amount of time spent developing expertise in any specific acquisition position. If traditional dual tracking were reinstated, officers in the dual-track career path—command officers operating within their secondary acquisition specialty—would also be expected to have non-acquisition broadening assignments, or joint assignments,[13] along the way.[14]

The Army, as an example, summarizes an acquisition officer's career generally as shown in Figure 1.

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10 J. Ronald Fox, *Defense Acquisition Reform, 1960–2009*.

11 Defense Officer Personnel Management Act, December 12, 1980, codified at 10 U.S.C. Chapter 87.

12 Major Thurman C. C. McKenzie, U.S. Army, Monograph, "The Defense Officer Personnel Management Act—the Army's Challenge to Contemporary Officer Management" (Ft. Leavenworth, KS: School of Advanced Military Studies, United States Army Command and General Staff College, AY 2011), 25, http://www.dtic.mil/dtic/tr/fulltext/u2/a545125.pdf.

13 See 10 U.S.C. §619a, which provides that "[a]n officer on the active-duty list of the Army, Navy, Air Force, or Marine Corps may not be appointed to the grade of brigadier general or rear admiral (lower half) unless the officer has been designated as a joint qualified officer in accordance with section 661 of this title."

14 McKenzie, "The Defense Officer Personnel Management Act," 30.

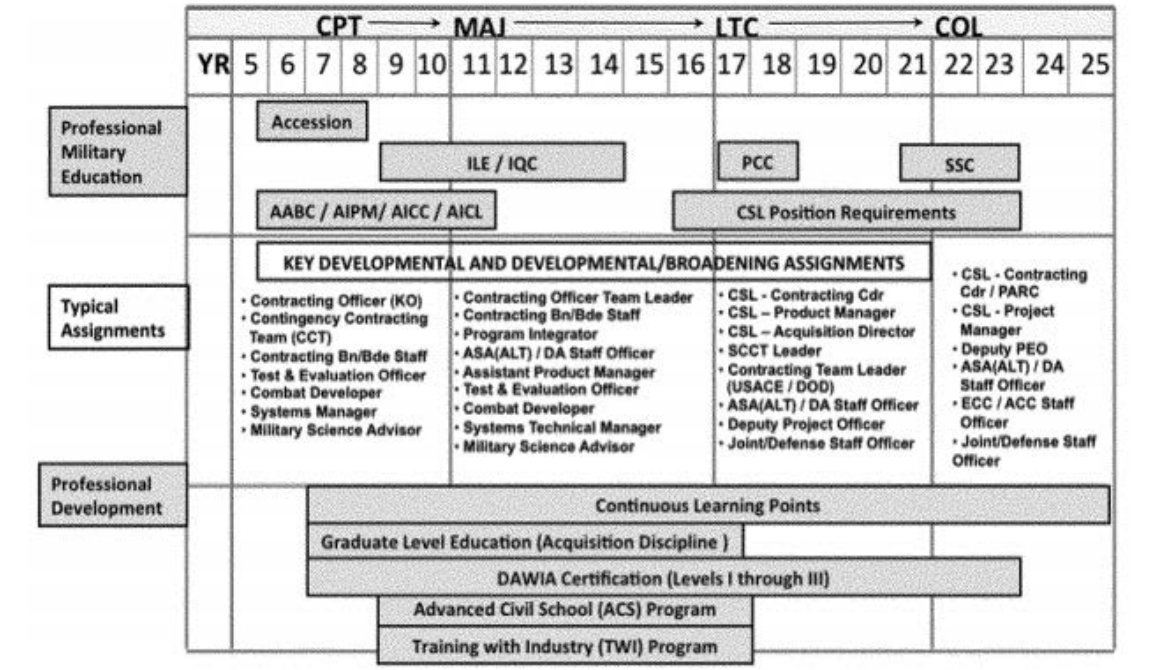


Figure 41–2. AC officer development

Source: Department of the Army Pamphlet (DA Pam) 600-3, "Commissioned Officer Professional Development and Career Management," December 3, 2014, Figure 41-2, 442.

Note: AABC = Army Acquisition Basic Course; AICC = Acquisition Intermediate Contracting Course; AICL = Army Intermediate Contracting Lab; AIPM = Acquisition Intermediate Program Management Course; ILE = Intermediate Level Education; IQC = Acquisition Intermediate Qualification Course; PCC = Pre-Command Course; CSL = Centralized Selection List; and SSC = Senior Service College

Figure 1. Army Acquisition Officer Development

The Army states:

> Ideally, officers are accessed into FA 51[15] through the Army Acquisition Corps Functional Designation Board or quarterly VTIP at their 6th or 7th year of service…Upon accession, officers are optimally assigned into FA 51 positions prior to their 7th year of service.[16]

The Services each have a different approach to the career progression for officers in the acquisition field. For example, the Air Force actively recruits lieutenants from the Air Force Academy or Reserve Officer Training Corps (ROTC) into the acquisition community. That Service then sends those recruits out to the force to obtain a breadth of experience in non-acquisition postings. The Air Force is less adamant than the Army about

[15] U.S. Army Functional Area 51—commissioned officers in the Army Acquisition Corps are designated as FA 51 officers and can be assigned to five of the 13 acquisition career fields. Non-commissioned officers are managed through a specific military occupational specialty 51C-Acquisition, Logistics, and Technology Contracting NCO.

[16] DA Pam 600-3, paragraph 41-3, 438.

its acquisition officers having combat-related experience, while the Navy is more adamant. In either case, the most relevant training, education, and experience in program management must be garnered in the years between when an officer enters the acquisition workforce—in the case of the Army, their 7th year of service—and the 21st through the 23rd year (as Table 1 indicates), after which they should be promoted to the grade of O-6. Note that Army FA 51 specialists are thus generally not eligible to join the Acquisition Corps until approximately 10 years of service, upon promotion to O-4.

Table 1. Typical Time in Service and Time in Grade for Army Promotions

Table 5–2
Time in service, time in grade, and promotion opportunity

Promote to:	Time in service (DODI and 10 USC)	Time in grade (DODI)	Promotion opportunity
CW2	2 years WOS	18 months	Fully qualified
CW3	7 years WOS1	3 years	Best qualified (80 percent)
CW4	12 years WOS	3 years	Best qualified (74 percent)
CW5	17 years	3 years	Best qualified (44 percent)
1LT/0–2	18 months	18 months	Fully qualified
CPT/0–3	4 years plus 1 year	2 years	Best qualified (90 percent
MAJ/0–4	10 years +/- 1 year	3 years	Best qualified (80 percent)
LTC/0–5	16 years +/- 1 year	3 years	Best qualified (70 percent)
COL	22 years +/- 1 year	3 years	Best qualified (50 percent)

Notes:
Time in service is separated into years of WOS for Technician and Aviation warrants.

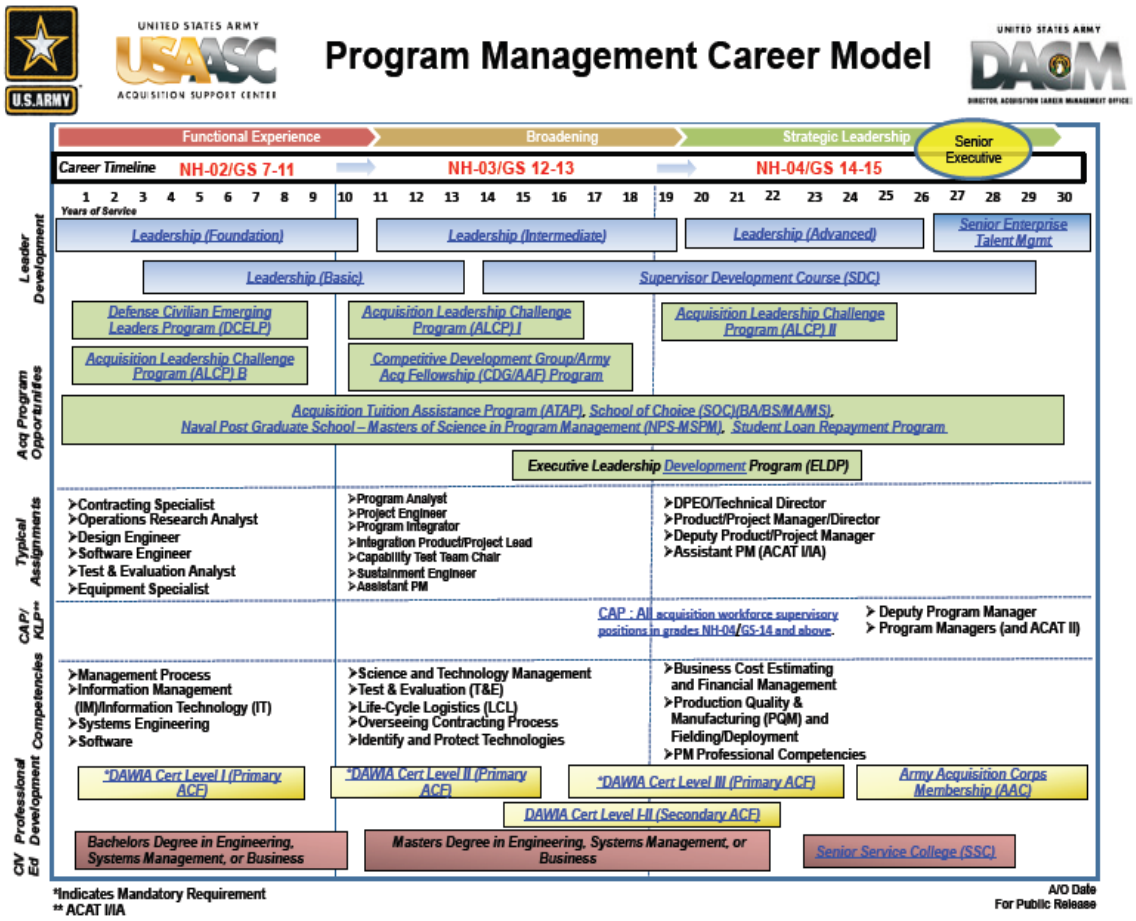
Source: DA Pam 600-3, "Commissioned Officer Professional Development and Career Management," Table 5-2, 36.

2. Civilian Career Progression

Figure 2 shows the career development path for civilians in the Program Management track. This path parallels the process followed by military officers, except that

- Civilians do not have access to all of the training institutions that military officers do; and
- Civilians begin serving in acquisition-related positions as soon as they are hired.

Depending upon their qualifications, upon being hired, a civilian will begin training in an acquisition job series immediately. Military officers have no such mechanism, at least in career fields that would lead to a program management career. There is no accession delay for the civilian as occurs with the military—acquisition training and the gaining of experience begins immediately. However, civilians enter in a job series—engineer, logistics, finance, etc.—rather than the leadership-dominant program management field. As a result, civilians routinely accrue acquisition-relevant experience in their early careers that military officers essentially never get.



Source: United States Army, Acquisition Career Management Office, *2014 Handbook: Civilian Project/ Product Manager*, 2014.

Figure 2. US Army Program Management Career Model for Civilians

DoD civilians working for the Army compete for selection for a PM position before the same Secretary of the Army-convened central selection boards that review military officers for such positions. In the Air Force, a PM position opening is posted and civilians apply for it just as they would any other job opening (through the www.USAjobs.gov website). Hiring decisions are made much as they are in the normal civil service job interview process.

In the Army, there are two centralized PM boards each year. The selection board is composed of former PMs and is divided between civilian and military members—the chair is rotated, with civilians manning it in odd-numbered years and military in even-numbered years. The first—for product managers[17]—is a Lieutenant Colonel (O-5)/GS-14 or equivalent level board usually held in September. The second considers Colonels (O-6)

[17] A *product manager* guides the design, development, and production of one or more products. In most cases, a *product manager* will be an O-5 or GS-14.

and GS-15 or equivalent civilians for a slate of project manager[18] positions.[19] There are approximately 50 product manager positions and 15 to 20 project manager positions filled each year by the Army using this process. We were told that the Air Force has a similar process that selects about 30 per year for project manager positions.

PM positions are selected and slated by fiscal year in the same manner as all other Army Competitive Category command positions. Slating is done from the centralized selection list (CSL) of O-6/GS-15 PM positions that have been approved by the Army Acquisition Executive (AAE).[20] The CSL identifies positions in the category of "best qualified" (BQ) or "military only." Both officers and civilians may compete for, and be slated into, a BQ position.[21] From that best qualified list, the AAE may, through another process used to match skills and experience of the individual to those required by the PM position (such as functional, technical, and educational experience), select and slate PMs.[22] Civilians (whether principals or alternates) may decline without prejudice if the slate is outside the regional preference designation submitted with the application. That means that they will remain eligible to compete in future years. All other declinations are deemed with prejudice. Declining with prejudice eliminates the civilian from consideration for any future command selection at that grade level.[23] In the Navy, civilian and military personnel apply and compete for specific programs. The Air Force designates whether a program will have a military or civilian PM, and the senior official who approves PM selections considers program needs along with individual qualifications and functional requirements in slating the PM selectee.[24]

B. Promotion of Acquisition Corps Personnel

Eckerd and Snider (2017)[25] reported that acquisition is often perceived as a less than desirable career field and that PMs are perceived to have fewer promotion opportunities than officers in operational career fields (e.g., combat-related fields). Several other

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18 A *project manager* manages a single project to develop a unique product, service, or result and, like a *program manager*, is in most cases an O-6 or GS-15.

19 Note that this is not a board to select PMs that would be assigned to ACAT I or IA programs.

20 See Army Regulation 70-1, "Army Acquisition Policy," July 22, 2011.

21 Ibid., 19, 20.

22 Government Accountability Office (GAO), "Defense Acquisition Workforce: Opportunities Exist to Improve Practices for Developing Program Managers," GAO-18-217 (Washington, DC: GAO, February 2018).

23 Ibid., 22.

24 Ibid., 18.

25 Adam Eckerd and Keith Snider, "Does the Program Manager Matter? New Public Management and Defense Acquisition," *American Review of Public Administration* 47, no. 1 (2017): 36–57, https://doi.org/10.1177/0275074015596376.

commentators advocate the establishment of a separate competitive category for acquisition corps officers.[26] The Congress attempted to level the playing field for "acquisition corps" officers through the provisions codified at 10 U.S.C. 1730(b), "Promotion Rate of Officers in Acquisition Corps," by stating: "the qualifications of commissioned officers selected for the Acquisition Corps are such that those officers, as a group, to be promoted at a rate not less than the rate for all line (or the equivalent) officers of the same armed force (both in the zone and below the zone) in the same grade." It should be noted that the Program Management career field comprises only a small fraction of the total Acquisition Corps, so that promotion statistics for the Acquisition Corps overall may not be indicative of promotion rates for Program Management specialists.

Congress has recently taken steps to reintroduce dual-track careers for acquisition professionals. This dual-track career path may conflict with the aim of increasing program success through "more relevant training, education, and experience." DAWIA sets requirements for certification, including education and years of experience. As Kinner (2012) points out, not all experience is necessarily credible or relevant experience, especially when preparing for a future role as PM. He asserts that the experience deemed acceptable under the DAWIA for PM certification can be misleading because it may not be related to actual management experience or may not be credible since it may be time spent in a totally unrelated field.[27] Kinner cited Government Accountability Office (GAO) report GAO-10-522[28] for this quote: "Officials from our case study programs indicated that prior experience gives a PM the knowledge to recognize and mitigate risks, and effectively respond to unanticipated problems that arise." Kinner points out that there have been no changes to the experience requirements of DAWIA since such standards were mandated in statute and policy, and that certification[29] may be disconnected from actual experience essential to a PM.

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26 Section 507 of the NDAA for FY 2019 adds section 649a—"Officers in Designated Competitive Categories"—to Title 10. That new section authorizes the Secretary of a Military Department to designate one or more competitive categories for promotion of officers under section 621, provided that the Secretary submits to the Committees on Armed Services of both houses of Congress a report on the designation of a competitive category. A Secretary of a Military Department has been authorized to establish competitive categories for promotion since 1980 under section 621 of Title 10. It is unknown at this time whether the innovations of the NDAA for FY 2019 will have any effect upon the establishment of a competitive category for program managers.

27 Jan Kinner, "Rethinking 'Acquisition Experience' for Program Manager Certification," *Defense AT&L*, November-December 2012.

28 GAO, "Defense Acquisitions: Strong Leadership Is Key to Planning and Executing Stable Weapon Programs," GAO-10-522 (Washington, DC: GAO, May 2010), https://www.gao.gov/assets/310/304106.pdf.

29 See DoDI 5000.66, "Defense Acquisition Workforce Education, Training, Experience, and Career Development Program," July 27, 2017. Certification. The professional credentialing process through which a military department or DoD Component determines that an employee meets the education,

The acquisition workforce contains individuals with functional specialties who, although having acquisition-related experience, do not become involved with and are not qualified to perform as a PM of ACAT programs.[30] Acquisition positions exist throughout the DoD structure in the Joint Staff, Service staffs, and Combatant Command staffs that permit certain officers to obtain "acquisition experience" credit that is unrelated to that needed in order to be certified as a Level III PM—this would be especially true for dual-track officers.

In FY 2009, throughout DoD there were 13,422 professionals[31] within the PM workforce—65 percent civilian (8,789) and 35 percent military (4,633)—constituting 10 percent of the total DoD acquisition workforce (133,103).[32] Of interest to the competitive category issue is the 4,633 military number—923 in the Army, 1,263 in the Navy/Marine Corps, and 2,447 in the Air Force. The Services manage promotions within competitive categories. That does not mean that a separate promotion board is convened to consider only the officers within a competitive category as the FY 2019 O-7 Navy promotion board instructions illustrate.[33]

That Navy O-7 promotion board was slated to recommend promotion for up to 32 O-6s broken out as shown in Table 2.

Table 2. Navy O-7 Promotion Competitive Categories

Competitive Category	Number to be Selected
Unrestricted Line	
(Operational—Combat-related)	21
Restricted Line	
Engineering Duty	1
Aerospace Engineering Duty	1

training, and experience standards required for the appropriate level (I (Basic), II (Intermediate), or III (Advanced)) in any acquisition career field.

30 See 10 U.S.C. §1721(b)-Program management; Systems planning, research, development, engineering, and testing; Procurement, including contracting; Industrial property management; Logistics; Quality control and assurance; Manufacturing and production; Business, cost estimating, financial management, and auditing; Education, training and career development; Construction; Joint development and production with other government agencies and foreign countries; and, Intellectual property.

31 The number in the program management career field at the end of FY 2015 was slightly higher, at 16,585 from a total acquisition workforce of 156,313. See DoD, *Acquisition Workforce Strategic Plan*, FY2016–FY2021, Title 10 U.S.C., §115b(d) and §1722b(c), undated.

32 *The Defense Acquisition Workforce Improvement Strategy*, Appendix 1: DoD Strategic Human Capital Plan Update: The Defense Acquisition Workforce, April 2010, A5-3.

33 See Secretary of the Navy, "Order Convening the FY-19 Promotion Selection Boards," Memorandum to the President, FY-19 Active-Duty Rear Admiral (lower half) Line and Staff Corps Promotion Selection Boards, October 2, 2017.

Information Warfare Community	4
Staff Corps	
Medical Corps	1
Supply Corps	2
Chaplain Corps	1
Civil Engineer Corps	1

Board members were assigned to one or more of eight identified promotion selection boards, with most being listed under that board assigned to select officers from the Unrestricted Line (17 of the board members assigned). Each of the separate boards had five to seven flag officers assigned, including the Admiral who was president of the overall promotion board and who sat on all of the boards; two other officers also sat on all eight boards. There was at least one officer on each specialty board who was identified as a member of the community that board was reviewing. Ten of those flag officers were identified as "acquisition corps representatives," although it is not known what portion of their careers were spent in Program Management positions. The voting on each of the seven specialty boards was dominated by unrestricted line officers.

The manner in which the Navy conducts its O-7 promotion boards may not be followed exactly by the other Services, but the important point to emphasize is that the criteria for promotion of specialty personnel, including acquisition personnel, are spelled out in the instructions to the board. For this case, the Secretary of the Navy provided the following instructions:

> Acquisition Professional (AP) community officers possess the requisite qualifications to manage the development, acquisition, and life cycle support of the Navy's current and future platforms and associated systems. Assignments given to these officers may have resulted in a career pattern different from officers who have served exclusively in their primary specialty. In making your determination of those officers who are best qualified for promotion, you must view the AP officer's assignments as having the same value as assignments within their primary specialty. Officers enter the AP Community late in their careers. In the context of best and fully qualified, the needs of the Navy require that you select officers with proven capacity for leadership as demonstrated in AP or other leadership positions. In considering AP officers for selection, the best qualified criterion is more important than balance among designators.[34]

Although that instruction on its face appears to conform with the mandate of 10 U.S.C. §1730(b), the criterion "proven capacity for leadership as demonstrated in AP or other leadership positions" suggests that reinstatement of dual-tracking could also reinstate past

[34] Ibid., 9, 10.

institutional biases in favor of dual-track personnel over their more specialized single-track colleagues.

C. Existing Incentives and Disincentives

1. Military Officer Incentives

The strongest incentives for military officers are related to the promotion process. Failure to be promoted not only reduces current salary and eventual retirement pension, but also can curtail a career due to the "up-or-out" provisions of DOPMA. As a result, factors that influence potential for promotion have a strong influence on choices made by military officers.

The timelines associated with promotion cycles limit the ability of military officers to remain in a specific position for more than a few years. In a sample of 115 recent Program Management career histories provided by the Army, military officers spent on average about 30 percent of their service time in postings unrelated to acquisition. Promotion in place is rare; typically, a particular position is associated with a specific officer grade, and promotion to a higher grade requires a transfer to a position appropriate to the new grade. Military officers typically do not decline a promotion, so serving officers are essentially required to move frequently from job to job. In a recent interview, General John Murray, head of the newly established Army Futures Command, noted the problem, saying:

> We've got to change the culture [to where] it's OK to [extend tours in key acquisition positions], because what you get in the Army is what you reward. And the way we reward people is through promotion boards and advancement, and you get that in the Army by commanding organizations, not by being associated with a program for an extended period of time.[35]

There are few, if any, financial incentives currently available for military officers in the acquisition field, other than promotion. The special and incentive pay categories that do exist are tied to operational deployments and specific career fields (e.g., aviation or a career at sea) or to being in the medical or Judge Advocate General (JAG) services.

The two potential non-financial incentives for military officers are status (in the form of military rank) and commendations. In terms of performance incentives, medals and commendations can be awarded to acquisition personnel in recognition of exceptional service.

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[35] David B. Larter, "US Army Looking to Extend Tours for Acquisition Officers," *Defense News*, September 6, 2018, https://www.defensenews.com/smr/defense-news-conference/2018/09/06/us-army-looking-to-extend-the-tours-for-acquisition-officers/.

2. Civilian Incentives

There are roughly 150,000 civilian employees (compared to fewer than 15,000 military officers) within the acquisition workforce. Of those 150,000, a little over 12,000 work in the program management functional area.[36] DoD uses financial incentives for hiring and recruitment, and to a lesser extent to reward exceptional performance. Recruiting incentives include student loan repayments, tuition reimbursement, cash recruitment bonuses, and other monetary and non-monetary incentives. In addition to performance bonus mechanisms common to all federal agencies, DoD has several unique authorities, some of which are specific to the acquisition workforce.

The Defense Civilian Acquisition Workforce Demonstration Program (AcqDemo), introduced in 1999, provides an alternative personnel system for qualifying civilian acquisition workforce employees. This includes streamlined hiring mechanisms, potential performance bonuses, a system of flexible pay bands with merit-based promotion, and additional authorities to hire a limited number of people at salaries well above the usual caps for GS or Senior Executive Service (SES) employees.

The Defense Acquisition Workforce Development Fund (DAWDF)[37] was established in 2008 "to provide funds, in addition to other funds that may be available, for the recruitment, training, and retention of acquisition personnel of the Department of Defense."[38] In addition to providing base salaries for expanded hiring of acquisition workforce personnel, the DAWDF funds recruiting incentives such as tuition reimbursement and student loan repayments. It also funds a limited amount of relocation expense reimbursement for civilians, and performance-based cash bonuses.

DoD has some other available monetary mechanisms to compensate civilians who have distinguished themselves.[39] DoD Component Heads are authorized to approve cash awards of $10,000 to $25,000 for individual civilian employees. Awards in excess of $25,000 can be made but require approval of the Under Secretary of Defense for Personnel and Readiness.

The Military Departments also have available to them a variety of special and incentive pay categories that permit the hiring of a limited number of civilians at special salaries well above the usual GS or SES pay scales. These include Highly Qualified Expert

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36 Under Secretary of Defense (Acquisition, Technology, and Logistics), *Performance of the Defense Acquisition System: 2016 Annual Report* (Washington, DC: DoD, October 24, 2016), 120, https://dod.defense.gov/Portals/1/Documents/pubs/Performance-of-Defense-Acquisition-System-2016.pdf.

37 10 U.S.C. §1705.

38 10 U.S.C. §1505(a).

39 DoD Instruction (DoDI) 1400.25, Volume 451, "DoD Civilian Personnel Management System: Awards," November 4, 2013.

(HQE) positions, and up to ten (at any one time) special hiring authority positions under AcqDemo. *Historically, the Military Departments have failed to use these authorities to the extent permitted by law.* In our interviews with the Service DACMs, they expressed some reluctance to use these authorities, due to a combination of administrative hurdles in executing them and an aversion to paying different salaries to people "in the same job."

In terms of non-financial incentives, DoD and the Military Departments also confer military-type awards for civilian service. These generally reward sustained meritorious service, in a civilian capacity, while being employed by the federal government. Presidential awards include Presidential Rank Awards for the Distinguished Executive, Meritorious Executive, Distinguished Senior Professional, and the Meritorious Senior Professional. The Congress can award the Congressional Gold Medal, which is comparable to the Presidential Medal of Freedom, to persons "who have performed an achievement that has an impact on American history and culture that is likely to be recognized as a major achievement in the recipient's field long after the achievement."[40] It is unusual for any of these awards to be given to defense acquisition workforce personnel.

Recognition awards unique to the DoD acquisition workforce include:

- Annual Acquisition Workforce PM Achievement Awards,
- The Defense Acquisition Workforce Individual Achievement Award,
- The Defense Acquisition Workforce Development Award,
- The David Packard Excellence in Acquisition Award,
- The Should Cost and Innovation Award, and
- The AT&L "Spotlight" Recognition Award.

At the individual level, these are rare awards, unlike the military decorations they parallel. It is not clear how much influence they have on PM selection boards or whether the group award is even reflected within an Officer Record Brief or within a civilian's personnel records.

There are non-financial disincentives for civilian Program Management track employees as well. Civilians in the Military Departments face several hurdles and disincentives to becoming PMs, and particularly PMs of MDAPs. To begin with, all Military Departments generally prefer that high-profile programs be managed by military officers. The Navy, in particular, makes wide use of their authority to designate specific management roles as military-only, reserving more than half of all PM positions for

[40] Matthew Eric Glassman, "Congressional Gold Medals, 1776-2016," CRS Report RL30076 (Washington, DC: Congressional Research Service, February 2017), https://fas.org/sgp/crs/misc/RL30076.pdf.

military officers. Civilians who apply for PM positions are already at a disadvantage relative to their uniformed colleagues.

In addition, the relocation requirements of PM postings can also be a significant disincentive to civilians. While military officers expect to be reassigned and relocated routinely throughout their careers, regardless of their career choices, civilians are more or less stationary depending on which job assignments and career tracks they pursue. Applying for a job as a PM can involve adding considerable uncertainty about where a civilian will be assigned, and for how long. The PM position will be for a specific duration—so the civilian faces the certainty that they will be moving twice as a result of acceptance of a PM assignment. Government financial and logistic support for civilian relocation is not as extensive as for military relocation. The DAWDF does have some provision for relocation incentive payments. From FY 2010 through FY 2014, 520 such payments were made to relocating civilians across the entire acquisition workforce (i.e., not just Program Management).

3. The Compensation Issue

Our review of private sector compensation data underscores that industrial and commercial PMs are demonstrably better compensated than their government counterparts, even at the MDAP level. We also found that military MDAP PMs are significantly better compensated than civilian PMs. This section quantifies those differences and highlights the incentives and disincentives that result from these disparities.

a. Military vs. Civilian PM Compensation

According to data received in this report from the Military Departments, the vast majority of DoD MDAP managers are either military officers serving at the O-6 level (Army, Air Force, Marine Corps Colonel; Navy Captain), SES civilians, or high-level GS-15s. A handful of MDAP PMs are general and flag officers at the O-7 and O-8 levels. Below the MDAP level, PMs are typically O-5 or O-6 military officers or civilians serving at the GS-14 to 15 level. As a matter of rank, a GS-15 is normally considered equivalent to an O-6, even though the GS-15 will be subordinate to the O-6 in a deputy PM position. The same can be said of the O-5 and the GS-14. The compensation review outlined below takes account of this overarching PM workforce structure.

From a total compensation perspective, military officers at the O-6 level are compensated significantly better than SES or GS-15 civilians. The pay differential results because in addition to Basic Pay, military officers also receive a large portion of their compensation in the form of non-taxable allowances—the Basic Allowance for Housing (BAH) and Basic Allowance for Subsistence (BAS). They also receive heavily subsidized healthcare through the TRICARE program, and other incidental subsidies such as the ability to shop at on-base exchanges and commissaries. Taken together, these

compensation and tax advantages add up to considerably more than the total compensation package of most senior GS-15s and members of the SES. The difference varies depending on geographic location and family situation, but is typically several tens of thousands of dollars.[41] This has been considered necessary because of the involuntary reassignments—particularly to overseas locales—to which the military member and their family are subjected.

Table 3 shows a comparison between an O-6 (with a family of four and 26 years of service) and civilians at various grades. For sake of comparison, the pay scales shown are restricted to averages found in the greater Washington, DC-Baltimore area. Most civilian DoD PMs are paid at one of the pay levels shown in the table.[42] For certain very high visibility MDAP programs where an O-7 or O-8 serves as PM, the comparison would be skewed even further in favor of the military. This comparison also does not include the value of the TRICARE subsidy, which will typically be another $10,000 to $20,000 per year, based on the marginal cost of comparable coverage in the marketplace.[43] This brings the equivalent civilian salary that would be needed to replicate the compensation value of an O-6 to well over $200,000.

41 DoD has formalized these compensation differences in DoDI 1100.22, "Policy and Procedures for Determining Workforce Mix," mostly recently updated December 1, 2017.

42 A review of federal SES pay shows some variation, depending upon whether the individual is in a federal agency with a certified SES Performance Appraisal System. The current 2018 pay range is from $126,148 to $189,000 for individuals in a federal agency with a certified SES Performance Appraisal System. As noted on the federal pay website, "Minimum pay under the ES scale is set at 120 percent of the pay of a GS-15 Step 1 employee, while the maximum compensation that can be paid to an ES employee is the current salary of the Vice President of the United States." See https://www.federalpay.org/ses/2018.

43 Civilians too receive heavily subsidized healthcare through the Federal Employees Health Benefits Program (FEHBP). Although not as generous as TRICARE, the government provides up to three times the amount of the employee premium share paid by the civilian employee for healthcare.

Table 3. Comparison of Comparative DoD PM Pay Bands – Washington, DC-Baltimore Area 2018 Pay Scale

Federal Pay Grade System	Max Base Pay	BAH + BAS	Tax Benefit	Total Compensation Package
Military 06 26 Years	$136,468.80	$42,508.68	$11,989.63	$190,967.11
GS-15 Step 4	$148,267.00	-	-	$148,267.00
GS-15 Step 6	$157,253.00	-	-	$157,253.00
GS-15 Step 8	$164,200.00	-	-	$164,200.00
GS-15 Step 10	$164,200.00	-	-	$164,200.00
ES-IV	$164,200.00	-	-	$164,200.00
ES-V	$153,800.00	-	-	$153,800.00
NH-IV (AcqDemo)	$164,200.00			~$164,200

Sources: All 2018 calculations are taken from "General Schedule (GS) Payscale Table for 2018," FederalPay.org, https://www.federalpay.org/gs/2018; "Senior Executive Service Pay Calculator," FederalPay.org, https://www.federalpay.org/ses/calculator; and "Military Compensation," DoD, https://militarypay.defense.gov/calculators/rmc-calculator.

Note: Federal GS pay rates assume locality rates for the Washington, DC-Baltimore metropolitan area with an adjustment of 28.22 percent, capped by statute at $164,200. Military compensation and tax benefit estimated for a married person, family of four, residing in a Washington, DC suburb.

b. AcqDemo

There are vehicles to provide additional compensation to civilian DoD PMs under the AcqDemo program as authorized by the Congress in the FY 2016 NDAA and codified in 10 U.S.C. 1762.[44] Pay broad banding, a contribution-based compensation and appraisal system (CCAS) rather than longevity-based compensation, and accelerated compensation for development positions are all part of the AcqDemo approach. These approaches to providing additional compensation are highlighted in Chapter 5 of the recently published *AcqDemo Operating Guide*.[45]

Cash awards to civilians are permitted under AcqDemo. Such awards "may include, but are not limited to, special acts, patents, invention awards, suggestions, exemplary personal effort, and on the spot."[46] Many of these awards focus on science and engineering support, not necessarily program management per se. Nonetheless, AcqDemo does provide for cash awards for PMs above and beyond their basic pay bands.

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44 For the most recent DoD update on the AcqDemo program, see "DoD Civilian Acquisition Workforce Personnel Demonstration Project (AcqDemo) Operating Guide," Version 2.3, June 7, 2018, http://acqdemo.hci.mil/docs/Operating_Guide.pdf.

45 Ibid., 151–191.

46 Ibid., 175.

For example, the Service Acquisition Executives of an AcqDemo Participating Organization can provide "individual cash awards not CCAS rating based within a range between $10,000 not to exceed $25,000."[47] These cash awards could then theoretically offset for civilian PMs at least a portion of the compensation advantage of military PMs. In theory, this could result in an NH-IV employee receiving compensation of nearly $190,000 in a year, nearly closing the pay gap. However, few civilians will receive such bonuses on a regular basis, and typical bonuses are on the order of 2 percent of base salary. Only a small number of civilians would potentially be eligible to earn as much as every O-6, even using these bonuses to their maximum permitted extent.

[47] Ibid.

3. Data Insights—PM Tenure

We collected data from several sources on the acquisition workforce—PMs specifically—as well as characteristics of MDAPs, to help identify candidate incentives for recruiting, retaining, and rewarding PMs. Table 4 summarizes the number of individuals on the acquisition workforce in the third quarter of FY 2017. In total there are 163,279 individuals in the acquisition workforce, 10 percent of which are in the PM career field. Of those in the PM career field, 72 percent are civilians.

Table 4. Number of Individuals in the Acquisition Workforce in FY 2017 Q3

	Civilian	Military	Total
Acquisition workforce	147,868	15,411	163,279
PM career field	12,313	4,697	17,010

Source: The Office of Human Capital Initiatives, "Defense Acquisition Workforce Key Information," Presentation, June 30, 2017, http://www.hci.mil/docs/Workforce_Metrics/FY17Q3/Overall_Key_Information_FY17Q3.pdf.

While the number of acquisition professionals in the PM career field is relatively large, the number who go on to become PMs of MDAPs is much smaller. The 87 MDAPs that were ongoing as of December 2017 had 68 military PMs and 19 civilian PMs.[48]

In the remainder of this chapter, we discuss our observations from two additional data sources. First, we worked with the Army DACM office, where they supplied us with detailed data on the career history of individuals who have held an Army PM position within the last five years.[49] In section 3.A, we discuss observations on PM careers from these Army PM workforce data. Second, we collected data on 202 past and present MDAPs and their PMs from December 1997 to December 2017 from the Defense Acquisition Management Information Retrieval (DAMIR) System, a database of historical acquisition reports maintained by OUSD(A&S)/Acquisition Resources & Analysis. In section 3.B, we discuss our observations on the tenures of MDAP PMs.

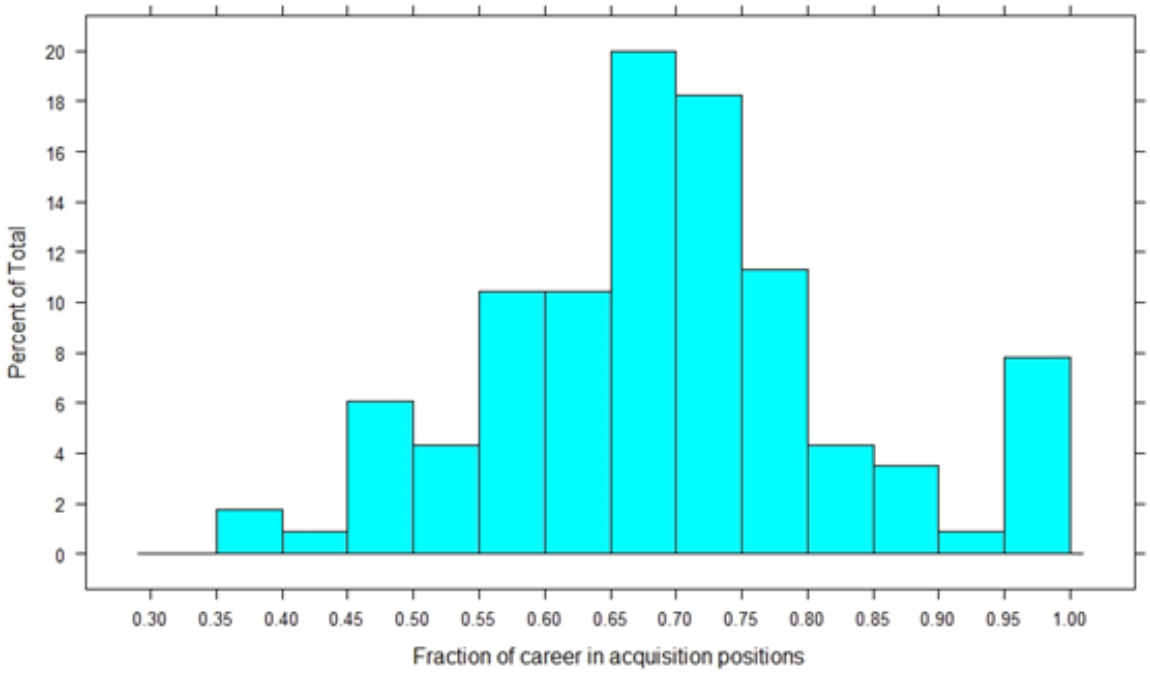
A. Army Program and Project Manager Workforce Data

As mentioned previously, the Army DACM office supplied us with acquisition position history of recent individuals who have served as either a PM or a project manager.

[48] Defense Acquisition Management Information Retrieval (DAMIR) System.

[49] Note that no personal identifying information was included in this data set.

In total, the data set included 108 military officers, two civilians, and five who transitioned from military to civilian in this sample. Many of these records included gaps between positions—which we interpreted to mean the individuals moved to positions outside the acquisition career field. Figure 3 displays the distribution of time these PMs spent in the acquisition career field, measured from the start date of their earliest acquisition position. Notably, military PMs spend less than 70 percent of their acquisition careers in acquisition positions on average, and 44 percent spend more than a third of their acquisition career in non-acquisition positions. The two civilians in the data set both spent more than 99 percent of their careers in acquisition positions.



Note: The fraction of the career individuals in the Army PM career field have spent in an acquisition position is measured starting from the first date of any position in the acquisition career field.

Figure 3. Fraction of Acquisition Career That Recent Army PMs Spend in Any Acquisition Position

The Army PMs in the sample provided have tended to hold a large number of positions. On average, they are in the acquisition career field for around 17 years; during that time, they held an average of 9.3 positions, with roughly one-third of them holding more than 10 different acquisition positions over the course of their career as shown in Figure 4.

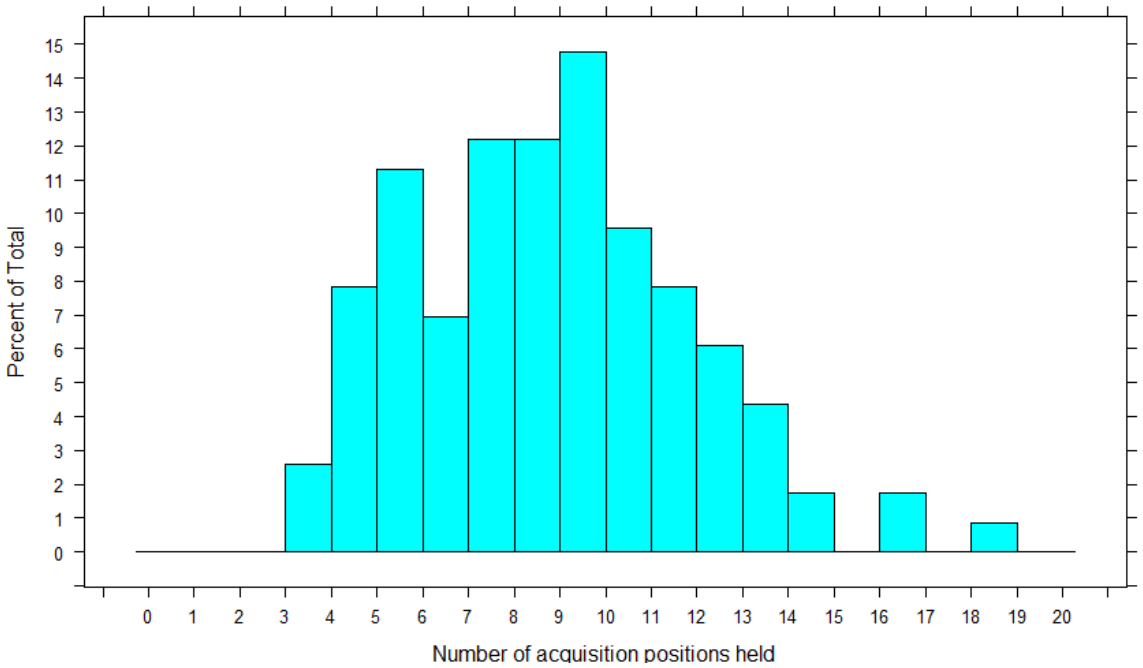
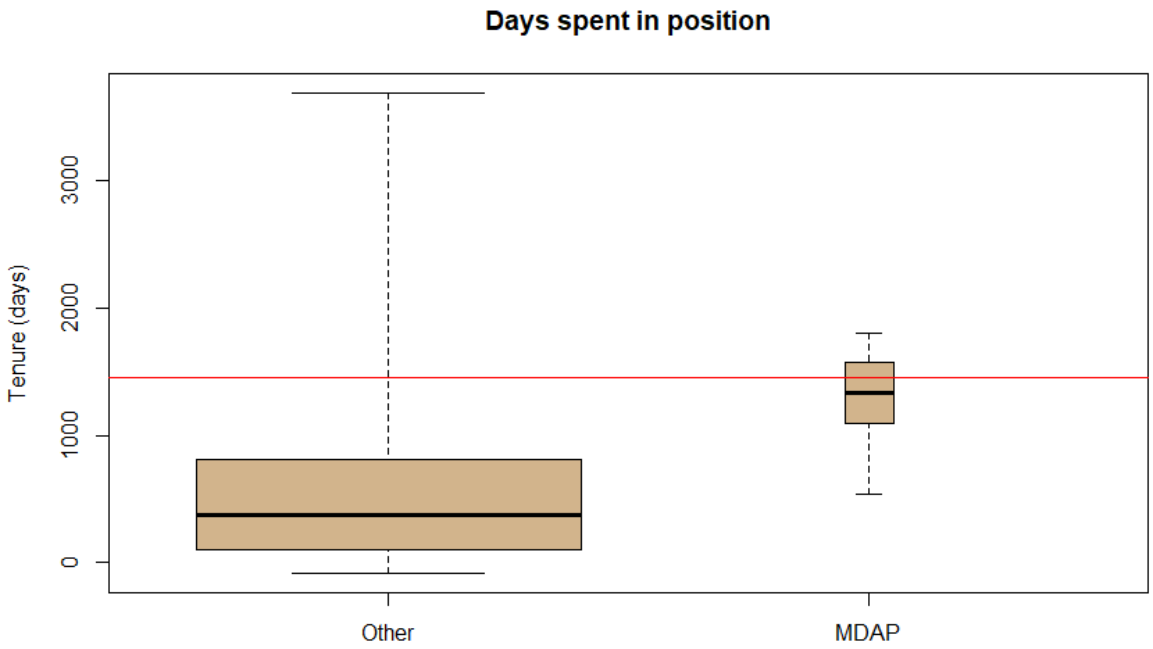


Figure 4. Distribution of the Number of Acquisition Positions Held by Recent Army PMs

Of the 115 PMs in the Army data, we were able to identify 23 as having been PMs for MDAPs, including two who served as PMs of two separate MDAPs (a total of 25 positions). Figure 5 shows that, in general, program management professionals remain in MDAP PM positions significantly longer than they stay in other career assignments. Even so, only six of the 16 completed MDAP PM assignments in this data set reached four years. (We excluded the other 9 MDAP PM tenures from the comparison, as they were still ongoing when the data were collected.)



Note: The boxplots represent the distribution of eventual position tenure for acquisition positions in the Army sample. The box on the right shows MDAP PM assignments; the box on the left is all other positions held by eventual PMs in the Army sample. The areas of the boxes are proportional to the number of observations. The red line indicates the four-year statutory requirement.

Figure 5. Distribution of Average Army PM Tenure for MDAP and Non-MDAP PMs

B. Tenures of MDAP PMs

PMs of MDAPs are required by the provisions of 10 U.S.C. §1734 to "be assigned to the position at least until completion of the major milestone that occurs closest in time to the date on which the person has served in the position for four years." According to the same statute, the Service Secretaries can grant waivers to reassign PMs before the corresponding major milestone "only in exceptional circumstances." Paragraph 4c of Enclosure 2 to DoDI 5000.02 states:

> A Program Manager of an ACAT I or IA program should be assigned to the position during the period leading up to (approximately 6 months prior to) a major milestone or decision point initiating a phase of the acquisition process. The incoming program manager should lead the effort to have that phase approved and manage the execution of that phase. One measure of a program manager's performance should be the successful execution of a phase of the program he or she planned and the MDA has approved. Program managers will be assigned for at least 4 years or until completion of the phase of the program that occurs closest in time to the date on which the person has served in the position for 4 years.

Thus, the statutory and regulatory tenure requirement is not four years. Instead, it is for a variable time that taken literally could be as much as six or seven years.

PMs have been required to sign agreements with the Component Acquisition Executive (CAE) and agree for an ACAT I program to remain in the position for four years or more, and for lesser ACAT programs to stay for three years or more. What we found, as Figure 5 indicates, was that most PMs, depending upon the Service, continue to serve in their position for less than the required four-year minimum. Records do not disclose why those PMs that served less than four years left the position. However, the DOPMA up-or-out and mandatory retirement mandates may be the culprit in many cases. A detailed examination of the historical tenure of DoD PMs from 1997 to 2017 is provided in Appendix A.

4. Literature Review

There is an extensive body of published literature that addresses DoD materiel acquisition, including the duties, authority, responsibilities, and performance incentives of DoD PMs. Schwartz, Francis, and O'Connor (2016)[50] report that there have been 150 major studies on acquisition reform since the end of World War II. The most influential of these have articulated that improvement of the acquisition workforce is the key to acquisition reform. Most of the official literature that describes the DoD acquisition system makes little distinction between a civilian and a military PM,[51] other than that some PM positions are designated as military only.[52]

A. Incentives

Incentives for military and civilian PMs may be quite different from those that are effective in industry, as the introduction to the Army's *2014 Handbook: Civilian Project/ Product Manager* states:

> PM/PD positions are among the most challenging in the acquisition workforce and, without a doubt, require hard work and personal sacrifices on the part of those who occupy them. However, former PMs testify that the sacrifices are mitigated by the challenging work, the feeling of accomplishment and the career-enhancing opportunities. A successful tour as a PM/PD "brands" you as a proven leader ready for additional senior acquisition leadership positions.

Lee and Wilkins (2011) suggest that public sector managers may be attracted to their work by different factors than private sector managers, and that differences in motivation suggest different systems of rewards and incentives should be used to recruit and retain productive workers.[53] They cite extensive previous research that indicates that extrinsic motivation factors (e.g., salary, pension plans, and career advancement) have significantly

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50 Moshe Schwartz, Kathryn A. Francis, and Charles V. O'Connor, "The Department of Defense Acquisition Workforce: Background, Analysis, and Questions for Congress," CRS Report R44578 (Washington, DC: CRS, July 2016), https://fas.org/sgp/crs/natsec/R44578.pdf.

51 DoDI 5000.02, "Operation of the Defense Acquisition System," incorporating Change 3, August 10, 2017.

52 United States Army, Acquisition Support Center, *2014 Handbook: Civilian Project/Product Manager*, 19.

53 Young-joo Lee and Vicky M. Wilkins, "More Similarities or More Differences? Comparing Public and Nonprofit Managers' Job Motivations," *Public Administration Review* 71, no. 1 (January/February 2011): 45–56, https://doi.org/10.1111/j.1540-6210.2010.02305.x.

greater potential for motivating private managers, while intrinsic rewards (e.g., challenging and interesting work, job responsibility, advancement/promotion in a hierarchical organization, family-friendly policies, commitment to the public interest, a desire to serve others, self-sacrifice, and recognition) have higher potential for motivating public managers.

Bryant (2016) summarized previous research findings on workplace incentives in the commercial sector as conflicting because some concluded non-cash incentives were more important than cash incentives, while others concluded that non-cash and cash incentives taken together were better than either alone, while still others concluded that top management support was most important to project success. His own regression analysis based upon responses to a 56-question survey sent to 3,000 randomly selected informational technology specialists, of which 164 responded (128 responses required for a 95 percent level of significance) concluded:

- Top level management support had the strongest relationship with project success and cash had the least relationship with project success;
- There is lack of support for non-cash incentives such as flexible work hours, communicating success, non-personal gifts, career development, and formal feedback; and
- There is a strong relationship between project success and personalized gifts, educational opportunities, informal feedback, and resentment when others receive a non-cash incentive and the respondent did not.[54]

There appears to be less previous research on what incentives would be most effective in inducing senior civilian employees and military officers to remain in PM positions. Fox (2011)[55] concluded that:

> Acquisition career paths for both military and civilian personnel need to include genuine promotion opportunities at least comparable to those provided in military operational career fields … If, as has been the case for five decades, the military promotion system will not respond to repeated attempts to provide attractive promotions and career opportunities for acquisition managers to attain flag or civilian equivalent grade, then the Defense Department should provide other incentives, such as additional pay and incentive compensation. If an extra $30,000 or more per year were paid to selected military officers and civilians (at the rank of O–6 and above) and

54 Robert Graham Bryant, "The Relationship of Management Support, Cash Incentives, Non-cash Incentives, and Project Leadership to Project Success in Information Technology Organizations" (PhD diss., Northcentral University, 2016).

55 Fox, *Defense Acquisition Reform, 1960–2009*.

> career regulations permitted them to remain in the acquisition field, incentives to retire and join the defense industry would be minimized.

Thus, Fox concludes that the prospect of promotion to flag officer or the civilian equivalent, additional pay and incentive compensation, and career longevity are effective incentives that might persuade a senior civilian or military officer to accept a PM position and stay in that position for four years or more.

Jeffrey, Dickinson, and Einarsson (2013)[56] conducted an email survey of employees of respondent firms who were responsible for program administration including providing incentives to employees. Of 2,000 potential participants, 170 responded. They looked primarily at the use of tangible incentives in organizations—those rewards that have a market value but are not cash (e.g., merchandise, travel, and pre-paid debit cards).[57] Within the firms surveyed, in general, incentives were used predominantly for individual contributors but rarely for senior management; support functions (staff functions) such as IT, marketing, and human resources were also infrequent targets of incentive plans.[58] Cash was used the least frequently as an incentive, with 30 percent of respondents stating that their firm used cash as an incentive, but only 6 percent of those stating that cash was the *sole* incentive used.[59]

B. Factors for Program Success

Eckerd and Snider (2017)[60] report that the defense acquisition reform policies of the 1990s all share a common frame of reference—that being that program outcomes can be improved by appointing PMs with more relevant training, education, and experience—yet, at least at the aggregate level, programs have continued to miss their cost, schedule, and performance targets. They report longer tenures were thought to contribute to PM experience and program stability as well as enhance PM accountability. However, GAO (2008)[61] found that of 39 major programs started since March 2001, the average PM tenure

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56 Scott A. Jeffrey, Alyce M. Dickinson, and Yngvi F. Einarsson, "The Use of Incentives in Organizations," *International Journal of Productivity and Performance Management* 62, no. 6 (November 6, 2013): 606–15, https://doi.org/10.1108/IJPPM-12-2012-0139.

57 Questions asked were: (1) What is the current usage of these award types?; (2) How do program managers select incentive types?; (3) What is the targeted value of the award (dollar/award) by award type?; (4) How is the award value determined?; (5) How effective is the award in achieving program objectives?; and (6) How is program effectiveness determined?

58 Jeffrey, Dickinson, and Einarsson, "The Use of Incentives in Organizations," 608.

59 Ibid., 610.

60 Eckerd and Snider, "Does the Program Manager Matter?"

61 GAO, "Defense Acquisitions: Department of Defense Actions on Program Manager Empowerment and Accountability," GAO-08-62R (Washington, DC: GAO, November 2007), https://www.gao.gov/assets/100/95239.pdf.

was only 17 months (see Appendix A for more recent data).[62] The Defense Business Board (DBB) (2011)[63] concluded that short tours as a PM led to short-term decision making and risk avoidance, which is detrimental to a program in the long term. Clowney (2016)[64] reported on 11 factors that influence DoD acquisition program terminations, but PM tenure was not one of those factors.

Eckerd and Snider (2017)[65] contend that the move to increase PM tenure generally had failed because:

- Assignment and promotion policies for uniformed officers favored frequent career broadening rotations among a variety of positions;
- Acquisition was often perceived as a less than desirable career field;
- Active duty PMs saw themselves as having nominal charge over their programs, with little real authority because of the many overseers and stakeholders who held sway over their program's direction;
- PMs were perceived to have fewer promotion opportunities than officers in operational (e.g., combat-related) career fields;
- Career planning and management of PMs received little emphasis; and
- Active duty PMs had incentives to leave their positions for other more career-enhancing assignments at their earliest opportunity.

The Defense Science Board (DSB) conducted a study of PM tenure and concluded that "industry program managers have tours up to 10 years with four to six years being quite common."[66] Wood (2010)[67] surveyed 146 industry managers to measure industry views on key competencies necessary in government PMs in 20 technical/business and 15

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62 The Army DACM reported that the tenure issue has been solved by the institution of tenure agreements between the Milestone Decision Authority and the PM. Subsequent GAO findings confirm that PM tenure is longer now than in their 2008 findings.

63 Defense Business Board, "Report to the Secretary of Defense: Review of DoD's Program Managers," Report FY11-03, April 2011.

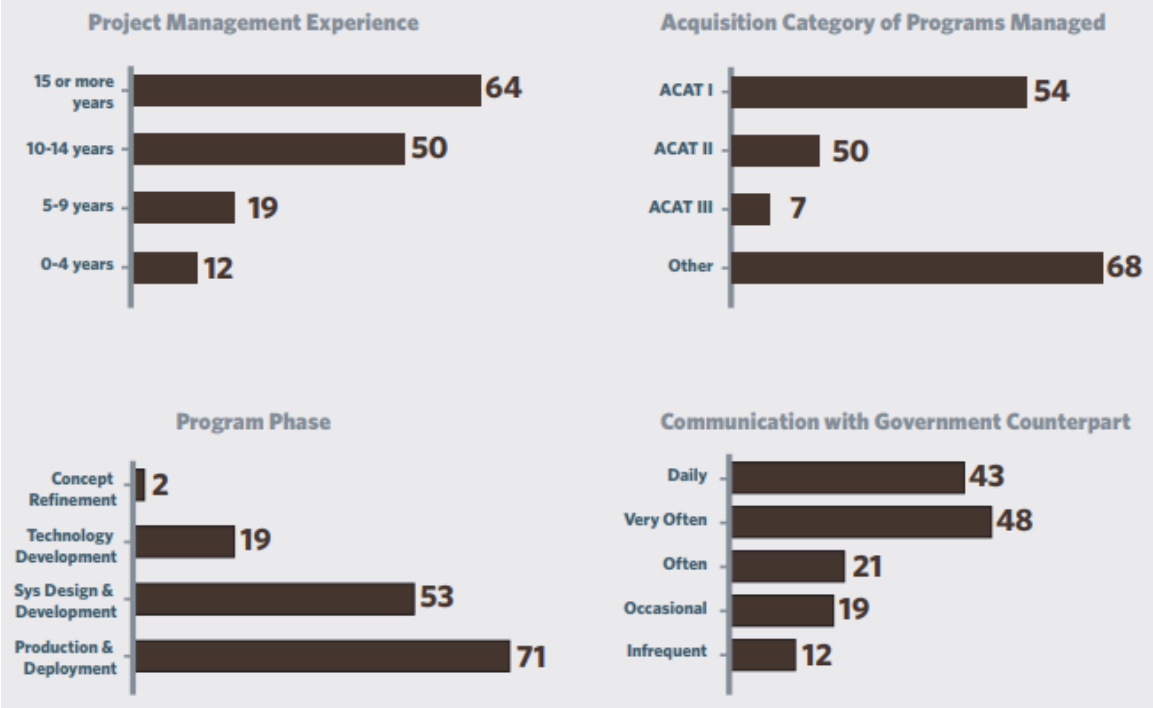
64 Patrick Clowney, "Colossal Collapses: An Analysis of 11 Department of Defense Acquisition Program Factors that Influence Department of Defense Acquisition Program Termination Using Relative Importance Weight and Chi-squared Distribution" (Washington, DC: The George Washington University, August 2016).

65 Eckerd and Snider, "Does the Program Manager Matter?" 41, 42.

66 Mark V. Arena et al., Chapter 2, "Program Manager Tenure," of *Management Perspectives Pertaining to Root Cause Analyses of Nunn-McCurdy Breaches*, Vol. 4, *Program Manager Tenure, Oversight of Acquisition Category II Programs, and Framing Assumptions* (Santa Monica, CA: RAND Corporation, 2013), https://www.jstor.org/stable/10.7249/j.ctt5hhttw.10.

67 Roy L. Wood, "How Well are PMs Doing? Industry View of Defense Program Manager Counterparts" (Ft. Belvoir, VA: Defense Acquisition University, April 2010), http://www.dtic.mil/dtic/tr/fulltext/u2/a518857.pdf.

leadership/management skills. Although the results of the survey are interesting, perhaps the figure included of the respondents' demographics—extracted in Figure 6—is more telling. The industry managers responding to the survey had more experience than any military or civilian could garner under either career progression model described in Chapter 2. Seventy-seven percent of the industry managers that responded had 10 or more years of industry PM experience. That experience was gained in managing major defense programs—104 had managed Acquisition Category I or II programs, while 86 percent of those respondents indicated that those programs were in the Engineering and Manufacturing Development or Production phases when they managed them. The experience differential between industry PMs and DoD PMs is significant even though DoD civilians are recruited from the same sources as are industrial PMs but follow a different career path.



Source: Roy L. Wood, "How Well are PMs Doing? Industry View of Defense Program Manager Counterparts" (Ft. Belvoir, VA: Defense Acquisition University, April 2010).

Figure 6. Experience Levels of Civilian Managers from the Wood Survey

Wood's analysis,[68] based upon industry manager survey responses, showed that industrial managers claim that the most highly rated technical/business skills a PM must possess are the ability to determine program goals and deliverables and develop a budget.

[68] Ibid.

The most highly rated leadership/management skills that industry leaders believe a PM must possess are trustworthiness, project leadership, and decision making ability.

C. Military Officer Promotions

Although multiple commentators conclude that program success is correlated positively to "more relevant training, education, and experience," generally lacking are critical analyses of the time available in an officer's (or civilian's) career necessary to attain that training, education, and experience.

Eckerd and Snider (2017) reported that acquisition is often perceived as a less than desirable career field and that PMs are perceived to have fewer promotion opportunities than officers in operational (e.g., combat-related) career fields.[69] Several other commentators advocate the establishment of a separate competitive category for acquisition corps officers, but they do not examine what effect elimination of the up-or-out and mandatory retirement features of DOPMA would have on retention of PMs.

As McKenzie (2011)[70] reports, the Army promotes by "cohorts," which are "groups that are initially determined by the year an officer enters the military." Cohort year group officers in the grade of O-5 are normally considered for promotion to O-6 in the primary zone in their 21st year of service.[71] The typical Army acquisition officer who is promoted to O-6 will receive that promotion at 21 to 23 years of service. There are also time-in-grade requirements imposed by 10 U.S.C. §619(a),[72] as Table 1 (page 8) illustrates. However, there is an error in Table 1, as the time-in-grade requirement for an O-6 or O-7 to be promoted under 10 U.S.C. §619(a)(2)(B) is one year, not three, as shown in Table 1. There are three zones of consideration from which an O-6 might be promoted. As McKenzie explains:

> If selected for promotion "below the zone," officers advance to the next grade ahead of their cohort peers. If selected for promotion while in the "primary zone," officers advance to the next grade with their cohort peers; and, if selected for promotion "above the zone," officers advance to the next grade later than their cohort peers.

69 Eckerd and Snider, "Does the Program Manager Matter?"

70 McKenzie, "The Defense Officer Personnel Management Act," 17.

71 DA Pam 600-3, paragraph 3-7(b), 18.

72 Eligibility for consideration for promotion: time-in-grade and other requirements.

Officers in the grade of O-6 who fail to be selected for promotion by at least two selection boards (primary zone and above the zone[73]) will no longer be considered for promotion.[74] That means a non-promotable O-6 with 26 years of service will no longer be eligible for promotion to O-7. Similarly, officers are eligible for selection for O-6-level command or project/PM until their 26th year of service.[75] The import of the loss of promotion potential is that a PM may be serving in the middle of their four- or five-year assignment and at 25 or 26 years of service (47 or 48 years of age) be faced with the reality that they are no longer eligible for promotion to O-7. Twenty-six years is also the last longevity pay step for an O-6—there would be no more pay raises unless the officer is permitted to remain on active duty beyond 30 years.[76]

There is a potential retention dilemma in that if an O-6 is selected for promotion to O-7, they will be moved from the PM assignment to an O-7 billet upon confirmation by the Senate,[77] resulting in the loss of continuity in the PM assignment. Conversely, if the O-6 has been passed over twice, private-sector employment with industry and early retirement without a retirement pay decrement are incentives to leave.[78]

D. Civilians as PMs

Fox (2011)[79] reported that as far back as 1970, a Blue Ribbon Defense Panel[80] appointed by the president had advocated the use of more civilian managers. Fox later[81] contends that the PM concept works well in private industry because industry PMs, when

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73 Most officers are promoted from the primary zone; the percentage promoted from "above the zone" are typically a small percentage of those selected.

74 10 U.S.C. §619(c)(3).

75 DA Pam 600-3, paragraph 3-8a(5), 19.

76 "Monthly Basic Pay Table," Department of Defense, http://militarypay.defense.gov/Portals/3/Documents/ActiveDutyTables/2018%20Pay%20Table.pdf?ver=2018-02-02-160202-810.

77 See Letter from the Secretary of the Navy to the President of the FY-19 Active Duty Rear Admiral (lower half) Line and Staff Corps Promotion Selection Boards, October 2, 2017.

78 Fox, *Defense Acquisition Reform, 1960–2009*, 196.

79 Ibid., 62.

80 The Blue Ribbon Defense Panel, chaired by Gilbert W. Fitzhugh, was appointed by the president and the Secretary of Defense in July 1969 to examine the following areas: (a) organization and management of DoD, including the Joint Chiefs of Staff, the defense agencies, and the military services; (b) defense research and development efforts from the standpoint of mission fulfillment, cost, organization, time, and interrelation with the scientific and industrial community; (c) defense procurement policies and practices, particularly as they relate to cost, time, and quality; and (d) such other matters as the Secretary of Defense may submit to it from time to time. (Melvin Laird was the Secretary of Defense.) Their 237-page report contained six chapters: (1) Organization, (2) Management of Materiel Resources, (3) Management and Procedures, (4) Management of Personnel Resources, (5) Other Management Considerations, and (6) Conflicts of Interest.

81 Fox, *Defense Acquisition Reform, 1960-2009*, 198–9.

contrasted to the government PM: (1) have genuine decision-making authority regarding personnel assignments, promotions, technical matters, and budgets; (2) have years of training and experience in the work of their industry; and (3) understand the roles performed and the tactics employed within government, within industry, and between government and industry.

Eckerd and Snider (2017)[82] conclude, based upon an analysis of all of the MDAPs for which Selected Acquisition Reports (SARs) were available between 1997 and 2010, that there is no association between breach or high cost variance and the type of PM (civilian or military), and that civilian PMs are neither more nor less likely to breach or have relatively high unit cost variances. Further, they concluded that the length of time a PM has been on the job shows no association with either problematic outcomes or, inferentially, positive outcomes, and there are no significant differences in either breaches or cost variance problems across the different military services.

Santo-Donato (2002)[83] reported that, although the central selection process for PM positions works as described, military officer selections from product and project manager boards in FY 2000 and 2001 far outdistanced civilian selections for those positions that either a civilian or a military officer might occupy. He explains why civilians may decide not to seek PM positions, including: (1) civilians work in a career field rather than as a career generalist as a PM; (2) PMs spend 75 percent of their time traveling to temporary duty sites; (3) PMs report to multiple chiefs; (4) PMs do not receive any more pay than other GS-14 or 15 positions; (5) there is no control over where the selectee might be sent to work within a designated region; (6) the selectee has no control over their next job; (7) there would be less job satisfaction than that in the current job; (8) serving as a PM is a high-risk job; and (9) if a civilian fails in a "high visibility" board select position, their advancement is over, their bonuses are gone or curtailed, and their career is forever tarnished.

Civilian personnel are cited as having the same "more relevant training, education, and experience" deficiencies as military officers. Civilians generally do not have the same educational opportunities as military officers outside of the DAWIA required training. However, in terms of longevity, the civilian retirement system differs from the military system in that it has an age component as well as a "years-of-service" component.[84] The

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82 Eckerd and Snider, "Does the Program Manager Matter?," 48.

83 Arthur Santo-Donato, "Where Are All of the Civilian 'PMs in Waiting'? Incentivizing the Professional Acquisition Workforce to Aspire to Program/Project/Product Manager Positions," *Program Manager* (March-April 2002): 68–75.

84 Civilian employees are subject to the Civil Service Retirement System or Federal Employees Retirement System (subsequent to 1987). See "Federal Retirement Planning," FederalRetirement.net, http://www.federalretirement.net/fers_eligibility.htm. The minimum retirement age (MRA) is determined by the year in which an employee was born. That MRA varies from age 55, for those born before 1948, to 57, for those born after 1970. Those retiring at the MRA and 30 years of service will

effect is that civilians do not have mandatory retirement and pass-over rules like those affecting military officers. Civilians must generally be older than military officers with more years of service before they are eligible to retire with full retirement benefits. Except for special categories of employees, such as firefighters, law enforcement officers, and air traffic controllers, there is no mandatory age at which a federal employee must retire.[85]

draw full retirement immediately. Those retiring at the MRA with at least 10 years of service but less than 30 years will have the benefit reduced by 5 percent per year for each year the employee is under 62, unless the employee has 20 years of service, at which point the benefit starts at age 60.

85 Office of Personnel Management, *CSRS and FERS Handbook*, Chapter 50, April 1998. The basic annuity of any employee may not exceed 80 percent of the employee's high-3 average pay, which normally applies at 41 years and 11 months service. The employee may continue to work beyond that service point with no increase in annuity.

5. Program Management in Industry

This chapter discusses how industrial and commercial organizations integrate PMs into their overall operations and compensate them. This will be done in two separate sections.

In the first section, we evaluate the industrial approach to program management generally, and makes comparisons to DoD program management. The second section addresses the inherent compensation advantage PMs in the commercial and industrial sector have over their defense counterparts.

A. Industry Approach to Program Management

The program management discipline is highly regarded throughout the aerospace and defense (A&D) industry, and more broadly, throughout the commercial and industrial sectors. As noted by former Under Secretary of Defense (Acquisition, Technology and Logistics) Dr. Jacques Gansler in his 1980 book, *The Defense Industry*, in the A&D industry the role the PM plays in supporting the corporate enterprise is seen to be critical to the organization's business plan and ultimate financial success—be it for good or for ill.[86]

Each A&D contractor must not only retain design, development, and production capabilities, but it must also maintain the expertise to effectively manage technically complex weapon system, service, and information technology programs.

These organizational dynamics tend to make the A&D industry appear as less of a free market in the traditional sense than as a monopsony with very high barriers to entry.[87] Its very specialization, high level of necessary expertise, and limited number of DoD buyers makes the A&D industry more costly and somewhat insensitive to price.[88]

More broadly, throughout the US commercial manufacturing industry, there is a decided emphasis on both active program management and the maintenance of close relationships between senior corporate executives and PMs. Industry PMs have roles that

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86 Jacques Gansler, *The Defense Industry* (Cambridge, MA: MIT Press, 1980), 291, fn 38. Former Under Secretary of Defense (Acquisition, Technology and Logistics) Gansler noted that, "[i]t is common for a company… to fire the program manager or vice president of operations when the company gets into trouble with the DoD for being unable to live up to its initial 'buy in' on a program."

87 Ibid., 46.

88 Ibid., 51.

frequently align with and report to an industrial organization's highest senior level executives. Unlike in the DoD government experience, this dynamic serves to limit the industry PM's direct interfaces with program stakeholders other than the highest executives within the industrial enterprise. This is particularly the case in large-scale manufacturing and industrial projects.[89] Corporate managers focus on the financial bottom line—government managers have an entirely different focus.

If an entire enterprise's success or failure can rise or fall on the success of a particular program, the overall corporate investment in it will be much higher and the time, resources, and attention devoted to it much more intense. This is a natural result and byproduct of the commercial model that influences the broader executive-program management relationship.

This has not gone unnoticed in the defense acquisition community. As noted in Fox (2011), "The program manager concept works well in private industry.… Consider the unique characteristics of industry program managers, who usually report to the company president."[90]

- "They have genuine decision-making authority regarding personnel assignments, promotions, technical matters and budgets.
- They usually have years of training and experience in the work of their industry (e.g., development and production of missiles aircraft, tanks, ships, and guidance systems). They understand the goals and constraints of their customers and the ways in which their customers operate.
- They understand the roles performed and the tactics employed within government, within industry, and between government and industry. They are experienced practitioners in dealing with these situations."[91]

Program management is therefore highly valued and clearly focused within the US aerospace and defense industrial sector in particular.

Program management is highly valued within the broader commercial part of the US private industrial sector, as it is seen as a critical element of financial success throughout the business enterprise. Key processes in which industry PMs must gain expertise, as

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89 Leanne Bateman, "The Benefits of Applying Project Management in the Manufacturing Industry," Brandeis University, February 2012, https://projectmgmt.brandeis.edu/downloads /BRU_MSMPP_WP_Feb2012_Manufacturing_Industry.pdf; "Program Management Professional (PgMP)," Project Management Institute, https://www.pmi.org/certifications/types/program-management-pgmp.

90 Fox, *Defense Acquisition Reform, 1960–2009*, 198.

91 Ibid., 198–9.

identified in the Project Management Institute (PMI) program management certification process, include:

- Governance,
- Program life cycle,
- Benefits management,
- Stakeholder management, and
- Strategic program management.[92]

Program office coordination and planning, schedule and milestone setting, risk management control, and communication with the senior executive leadership are all deemed critical program management skill sets within the commercial sector.

These program management skills are of significance for both overall program performance and program continuity. A May 2010 survey of 251 manufacturing executives conducted by the Economist Intelligence Unit of *The Economist* found that "industrial manufacturing projects are more likely to come in on time and on budget when project managers report directly to senior executives.[93] The senior executive-PM relationship is thus thoroughly integrated within the private sector model. Performance, cost, and schedule are all seen as affecting sales, growth, and profitability.

From a DoD perspective, active program management would be akin to having senior PMs report only to the Service Acquisition Executive (SAE) and/or the Program Executive Officer (PEO). For military PMs, there is an entirely different dynamic at work, as they are also associated with their home Service and are part of a service command chain that is not necessarily aligned with the reporting chain of their PM responsibilities. For example, ACAT ID DoD PMs must interface with a much wider range of stakeholders, including Service headquarters, systems and operational commands, congressional members and their staffs, advocacy groups, and the Office of the Secretary of Defense (e.g., the Defense Acquisition Board (DAB), Overarching Integrated Product Team (OIPT),Cost Assessment and Program Evaluation (CAPE), etc.). These additional, and essentially political, relationships introduce yet another layer of personnel interfaces into the DoD PM's portfolio.

Against this backdrop, DoD PMs, no matter how diligent, professional, and educated, are seen to be at a net disadvantage in comparison to their industry counterparts. The defense PM role all too frequently approximates that of a "liaison manager," one that

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92 "Program Management Professional (PgMP)," Project Management Institute.

93 Economist Intelligence Unit, "Industrial Manufacturing: Managing for Success" (London: The Economist Intelligence Unit, May 2010), 2, http://graphics.eiu.com/upload/eb /Oracle_Ind_Man_WEBr.pdf.

attempts to accommodate a wide range of departmental and Service interests and, ultimately, Service program promotion. The DoD PM model could benefit from insights drawn from the active PM model of industry.[94] (For additional insights into industry approaches to PM development, refer to Appendix B.)

B. Compensation Comparison with Private Industry

1. Findings

The pay schedules of individual corporations were not available for this research, due to corporate restrictions on revealing competitive and proprietary information. GAO encountered the same data collection problem in its 2013 study of contractor compensation.[95] However, of the 27 contractors that responded (the three largest defense contractors did not provide compensation information), 1,322 non-executive management employees received compensation in 2011 in excess of the vice president's salary ($230,700). Those defined as non-executive management employees included PMs and directors, as well as others, such as systems engineers or intelligence analysts. The US Department of Labor does maintain an extensive statistical database on the compensation ranges for management occupations throughout the United States. Therefore, generally speaking, reasonable pay comparisons of US PMs in industry can be made with DoD military and civilian PMs by using this primary source, the US government compensation database.

In assessing the compensation of defense PMs with comparable industry counterparts, we reviewed the most recently available index, the May 2017 US Department of Labor, Bureau of Labor Statistics (BLS) index for key professions within the *Management Occupations* 11-0000 and *Architecture and Engineering* 17-000 code series. BLS salary data were reviewed against the mean, 75th percentile, and the highest paid, 90th percentile salary categories, all of which are displayed in Table 5.

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94 Fox, *Defense Acquisition Reform, 1960–2009*, 197–8. Fox discusses the liaison manager model of defense program management, concluding that it is far too passive, and more strongly supports an active program management approach that solely focuses on performance, cost, and schedule risk management.

95 GAO, "Defense Contractors: Information on the Impact of Reducing the Cap on Employee Compensation Costs," GAO-13-566 (Washington, DC: GAO, June 2013), https://www.gao.gov/assets/660/655319.pdf.

Table 5. BLS Data on Management Occupations 11-000 Series and Architecture and Engineering 17-0000 Series, May 2017 National Occupational and Wage Estimates

BLS Code	Number of Total Jobs	Title	Top 75% Percentile	Top 90% Percentile	Mean Salary
11-1021	2,212,200	General and Operations Manager	$156,580	>$208,000	$123,400
11-3021	365,690	Computer and Information Systems	$175,890	>$208,000	$149,730
11-3051	171,520	Industrial Production Manager	$130,820	$168,780	$110,580
11-3061	70,430	Purchasing Managers	$146,780	$182,780	$121,810
11-9021	263,480	Construction Managers	$140,420	$159,560	$101,000
11-9199	430,120	Managers, All Other	$139,480	$176,800	$113,810
17-2011	65,760	Aerospace Engineers	$140,420	$162,110	$115,300
17-2061	66,770	Computer Hardware Engineers	$147,020	$176,900	$119,650
17-2171	32,010	Petroleum Engineers	$139,480	>$208,000	$154,780

Source: "Occupational Employment Statistics, May 2017 National Occupational Employment and Wage Estimates, United States," Bureau of Labor Statistics, https://www.bls.gov/oes/current/oes_nat.htm#17-0000.

Matching the compensation of DoD PMs against industry managers within the 90th percentile BLS salary range was judged to provide the closest overall comparison. This approach best approximates what would be an equal representation of the relevant fraction of the defense acquisition workforce in the top tier of DoD PMs and PEOs that manage MDAPs, posed against similar top-tier managers in industry. These DoD PMs/PEOs would tend to have comparable experiences in terms of age, years of service, level within their respective organizations, and management responsibilities for multifaceted, complex programs of a major scale.

When compared to the nationwide compensation of senior industrial executives and PMs in the broader US economy, both DoD military and civilian PMs suffer in comparison. Nationwide private sector management salaries at the 90th percentile in key BLS job series generally exceeded the salaries of comparable DoD government managers by a wide margin; salaries in the 75th percentile were somewhat more comparable.[96]

Notably, the top 90th percentile of management position salaries for General and Operations Manager, Computer and Information Systems Manager, and Petroleum

[96] As mentioned previously, matching the compensation of DoD PMs against industry managers within the 90th percentile BLS salary range provided the closest approximation of what would be a representative PM position description.

Engineers exhibited pay rates in excess of $208,000 (before profit sharing). This put private sector mangers at least 16 percent above the highest O-6 adjusted military salary (adjusted for BAH and BAS), and more than 26 percent above the highest SES and GS-15 salary levels, for the greater Washington-Baltimore area alone. Further, the top 90th percentile of management position salaries for Purchasing Manager, Computer Hardware Engineers, Industrial Production Manager, and Managers, All Other exceeded the top GS-15 and SES base salaries of $164,200. Table 5 presents these data from nine key BLS-coded management and engineering series.

The Department of Labor's statistical database for the top three management job series essentially shows a salary floor starting at $208,000 for 90th percentile positions; the potential salary ceiling for positions within these job series would therefore be even higher. It is reasonable to conclude that the actual pay differential between comparable DoD and industry PMs is well over the 16–26 percent amount identified above, since the BLS data indicate that $208,000 is a starting point, implying a higher actual ceiling. This is consistent with the 2013 GAO findings on non-executive management employees described above.

Statutory limitations exist on how much aerospace and defense contractors can legally charge the government as allowable costs on cost contracts, for compensation of executives and managers.[97] Contractor employees can be compensated above the established cap, but the amount above the cap is unallowable under Federal Acquisition Regulation (FAR) cost accounting standards. However, the findings of this research nevertheless substantiate that a wide pay differential exists between DoD PMs and their counterparts in private industry.

2. Additional Private Sector Compensation

As demonstrated above, base salaries for industry managers are significantly higher than those of DoD PMs, with these salaries well in excess of military officer, GS, or SES pay scales. The compensation differential is further amplified when several additional factors alluded to in Appendix B are taken into account. These factors are related to private sector compensation profit sharing, and include:

- Program Management Incentive Pay
- Spot Awards and Bonuses
- Stock Options
- Deferred Compensation.

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97 See 10 U.S.C. 2324 (e)(1)(P). Costs above the prescribed ceilings are unallowable under covered contracts; these generally cover executive compensation as opposed to compensation of PMs. Current law established these ceilings as $625,000 for a contract employee (i.e., company executive) and $487,000 for a contractor or subcontractor, but they are adjusted annually. The cap was raised to $763,029 for 2012.

PMs in industry are frequently placed on corporate program management incentive pay plans. These plans enable additional incentive pay for select, high-performing individuals, including PMs. This is an approach to incentivizing those individuals with executive management potential to stay within the organization.

Spot awards and bonuses can be made during the course of the year in order to reward performance on special activities over a specific time period. Short-term pay incentives like spot awards and bonuses are often useful in achieving short-term corporate goals and objectives, such as program development, being awarded a contract, or achieving quarterly or annual sales forecast goals.

Members of private industry can benefit from the provision of stock options if their employer is a publicly traded company. This can provide substantial income potential to both executives and PMs, consistent with the growth in the stock price of the corporation.[98] Stock options are obviously not available to government employees.

Finally, high-valued executives and high-performing PMs can also receive deferred compensation over a longer term. This form of compensation is frequently received following separation from the corporation.

These additional forms of industry compensation would be entirely competitive with, and in most cases considerably higher than, cash awards in the range of $10,000–$25,000 that are available to DoD PMs in the AcqDemo program.

It is not unusual for comparable, high-level industry and commercial PMs to receive compensation well in excess of $200,000 when salary and all of these incentive pay options are taken into consideration.[99] This eclipses by a fair amount the compensation currently provided to PMs (both military and civilian) in DoD.

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98 "Biggest 1,000 Stocks," *Wall Street Journal*, July 3, 2018, B9. For example, the stock prices of key US A&D contractors have increased dramatically throughout the past 12 months.

99 Depending on the circumstances involved, deferred compensation and stock options could provide compensation well above even these levels.

6. Policy Alternatives to Improve Incentives

Table 6 and Table 7 list potential incentives for military and civilian PMs. There are two types of incentives—those used to attract and retain employees and those used to enhance performance of the workforce. The necessity for such incentives, and the type that are attractive, change as the employee matures and advances upward toward senior management levels. The checkmarks in the tables indicate the potential importance of that incentive to that stage of employee development. In this section, we describe and assess potential incentives from the accession stage through the PM assignment stage. These tables are not meant to be exhaustive lists of all possible policy actions—rather they reflect what we determined to be the most relevant alternatives, given expressed congressional intent, findings in the literature, and insights from the data and interviews described in the previous chapters. While there is some overlap between incentives that affect military officers and civilians, we treat military and civilian incentive policy options separately here because the necessary implementation actions (and likely side effects) can differ considerably between the military and civilian PM communities. We conclude with a general discussion of the pros and cons of performance-based or merit-based incentive programs that is applicable to both military officers and civilians.

Each table lists a combination of financial and non-financial incentives as reflected temporally over the course of the military officer's or civilian's career progression. We assess the pros and cons of each of these policy options in the appropriate section.

Table 6. Incentives for Military Members on the PM Career Path

Incentives	Entry Level Hiring & Retention	Mid-Level MilitaryTraining, Experience, Professional Education, & Retention	Senior Level Experience, Military Education, & Promotion Potential	PM Selection Experience, Education, Command Selection, & CAE Slating
Student Loan Repayment	√	√		
Paid Higher Education	√	√	√	
Military Schooling Selection	√	√	√	
Special & Incentive Pay	√	√	√	√
Bonuses	√	√	√	√
Special Merit/ Achieve Awards	√	√	√	√
Separate competitive category for promotion		√	√	√
Well-defined career track for PM	√	√	√	
End up-or-out			√	√
Do not dual track	√	√	√	√
More authority to recruit, retain, and manage staff			√	√
Performance-based ability to choose postings			√	√

CAE – Component Acquisition Executive.

Table 7. Incentives for Civilians on the PM Career Path

Incentives	Entry Level Hiring & Retention	Mid-Level Military Training, Experience, Professional Education, & Retention	Senior Level Experience, Military Education, & Promotion Potential	PM Selection Experience, Education, Command Selection, & CAE Slating
Higher pay scale	√	√	√	√
Merit-based promotion	√	√	√	
Merit-based pay scale	√	√	√	√
More bonus pay options	√	√	√	√
Acess to Military Schooling		√	√	√
Paid Advanced Education	√	√	√	
More PM positions awarded to civilians			√	√
More ability to choose or refuse assignments	√	√	√	√
Lateral hiring		√	√	
More ability to plan career	√	√	√	√
More authority to recruit, retain, and manage staff			√	√
Commendations and medals	√	√	√	√
Performance-based ability to choose postings			√	√

A. Military Incentives

1. Financial Incentives

As noted in Chapter 4, the literature on financial incentives for military personnel is mixed. Fox (2011) comes out most strongly in favor of financial incentives, arguing that additional pay of perhaps $30,000 annually could deter military and civilian PM attrition

to the private sector.[100] Bryant (2016) argues that a combination of financial and non-financial incentives taken together offer better promise and synergy than either of them taken alone.[101] Lee and Wilkins (2011) find considerable evidence in the literature that financial incentives are much less effective in the public sector, including in the military.[102]

Given the constraints on the military pay system, the primary financial incentive we consider for the military are bonuses. These bonuses could be awarded at recruitment (e.g., a signing bonus), for retention (retention bonuses), for specific assignments or career paths, or, if authorized by legislation, as spot bonuses to reward exceptional performance.

Currently few if any financial incentives, apart from promotion, are available for military officers on the program management career path, One possible way to create financial incentives for PMs would be to create special and bonus pay categories for specific assignments or career choices, similar to those that have been established for aviators and submariners.

A second, more comprehensive alternative would be to establish a separate competitive category (with a distinct pay scale) for professionals on the PM career path, as has been done for medical officers and JAG officers. This approach could encompass recruiting and retention bonuses as well, while also addressing non-financial incentives associated with promotion preferences. It may not be feasible to make program management a distinct competitive category, separate from other acquisition functional areas, without affecting the ability of skilled engineers, contracting, finance, and other specialists to transition into the PM career path and to serve as PMs when appropriate. The pros and cons of a separate competitive category for acquisition professionals is discussed in more detail in the following section.

It should be noted that any substantial financial incentives for military PMs would exacerbate the existing pay gap between military and civilian PMs. Any significant financial incentives for military officers should be implemented in parallel with comparable or larger incentives for civilians. Also, it goes without saying that retention bonuses for military officers can only achieve their desired intent if the targeted pool of officers can successfully compete for ongoing promotions, or if up-or-out personnel management policies and mandatory retirement thresholds are relaxed.

The recruiting and retention bonuses and career field incentive pay alternatives described above would apply equally to all officers in the designated career field. In theory, DoD, when authorized by legislation, could also authorize merit-based bonuses, providing

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[100] Fox, *Defense Acquisition Reform, 1960–2009*.

[101] Bryant, "The Relationship of Management Support, Cash Incentives, Non-cash Incentives, and Project Leadership to Project Success in Information Technology Organizations."

[102] Lee and Wilkins, "More Similarities or More Differences?"

cash awards for exceptional performance. This idea will be discussed more thoroughly in the context of medals and commendations in section 6.C.3.

2. Non-Financial Incentives

As noted in Chapter 2, the strongest non-financial incentives for military officers are related to the promotion process. Thus, to be successful, any attempt to incentivize quality military officers to pursue and remain in program management careers must either offer comparable (or superior) promotion potential relative to a career in operational command assignments, or must somehow bring other incentives to bear that can outweigh promotion as a driver of career choice behavior. There is no indication from the results of this research that there is a greater incentive for the O-6 PM than promotion to O-7.

a. Establish a Separate Competitive Category for Promotion

Congress has already begun to relax the DOPMA personnel management hurdles discussed above through its enactment of Sections 501 through 514 of the John S. McCain NDAA for FY 2019.[103] In addition to the financial incentives cited above, one way to make program management careers significantly more attractive to military officers wishing to follow the PM career path would be to create a new competitive category for career acquisition professionals. Under that system, promotions within the Acquisition Corps would be gauged solely against other Acquisition Corps members, and not against line officers within each Service. This would parallel the current system for uniformed medical personnel and Judge Advocate General officers. This separation would eliminate the need for informal promotion quotas by career field, and would explicitly protect those on the PM career path from discrimination on the grounds of lesser combat and/or command experience. It would also serve to signal to the officer corps that the Military Departments value specialized expertise in program management in the same way that they value medical or legal expertise, possibly including the kind of bonus pay those specialties confer. This expertise could in theory be obtained through lateral commissioning of highly-trained civilians, as with doctors, nurses, and attorneys,[104] in addition to the usual career path. The Secretaries of the Military Departments have the authority[105] to establish a competitive category for the Acquisition Corps, or even for program management professionals within that Corps, but have not done so.

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[103] Pub. L. No. 115-232, August 13, 2018.

[104] See Section 502 of the NDAA for FY 2019, which modified Section 533 of Title 10 to permit accession of those with special training or experience in a particular officer career field. The original appointment may be made at a rank as senior as Colonel in the Army, Air Force, or Marines, or Captain in the Navy.

[105] 10 U.S.C. §621.

There is a "slippery slope" argument against proliferating competitive categories, except in cases where DoD simply cannot compete with the private sector for skilled individuals. Workforce planning becomes more difficult; knowing exactly how many to attempt to recruit or promote in each category is harder than managing a common pool of officers. However, the Services already have systems for planning acquisition careers, as seen in Chapter 2. Making acquisition or program management a separate competitive category seems an obvious mechanism to comply with current requirements. Maintaining a healthy balance of officer age and experience levels is similarly more challenging when each category's workforce is separately managed.

For medical and JAG officers, the rationale for needing to recruit and highly compensate military officers with the requisite skills is that there are situations in which civilians with those skills cannot perform the mission (medical officers are subject to being directly exposed to hostile fire), and the skills are too specialized for line officers to be expected to have them. Doctors and nurses must be deployable to combat zones on short notice, in the event of hostilities. JAG attorneys must be available to serve as prosecution and counsel in military courts of justice anywhere that forces are deployed. The capabilities these individuals provide within the Services are fundamentally different from those provided by line officers, and the need to compete with private-sector opportunities justifies an enhanced pay scale.

It is not clear whether similar arguments would apply either to PMs specifically or to the broader Acquisition Corps. Contracting and program management require specialized skill sets that are different from those needed to command an operational unit—but as we shall see below, the Military Departments have historically strongly preferred officers who have spent at least the beginning part of their career in operational command assignments over pure acquisition specialists. (This is not true of surgeons or attorneys, who are typically not recruited until after having achieved some degree of professional certification in their chosen field.) In the end, the desirability of a separate competitive category hinges on the extent to which civilians can do the needed jobs and whether military officers can be expected to develop the necessary expertise in the course of a typical career. The Military Departments tend to argue that some program management jobs cannot be assigned to civilians, and that the training for Acquisition Corps officers is adequate to produce the needed program management expertise in the general pool of officers. Not all outside observers agree with either of these positions.

b. End Up-or-Out for PMs

As discussed in Chapter 2, the DOPMA mandates might be considered major disincentives, as they feature (1) mandatory retirement for an O-6, the grade at which most PMs serve, at 30 years; (2) a period of less than four years between the time of promotion to O-6 and the trigger to mandatory retirement—the 26-year point at which the O-6 will no

longer be eligible for promotion or for selection to be a PM; and (3) two-time pass-over rules that are an up-or-out trigger to maintain a youthful officer corps. Ending the up-or-out military promotion system for PMs and acquisition executives could create a strong incentive to recruit more military personnel into the PM career path and retain them over a longer period of time as military officers. It would permit longer tenure with military PM positions (and the acquisition profession as a whole), enabling such officers to stay in the military well into their mid-50s and even their early 60s as they are assigned to positions of ever increasing responsibility. Having such experienced personnel in key program management positions would be in line with the best practices in program management from private industry.

The DBB, while not advocating wholesale revisions to DOPMA, recommended in 2011 the establishment of different boards for promotion to field grade versus general/flag rank, and hinted at the elimination of mandatory retirement with the conclusion "Do not force retirement at 30 years."[106]

We concur that eliminating both up-or-out and mandatory retirement at 30 years of service would help the Department recruit and retain more skilled and experienced personnel to aspire to be PMs. These changes would also enable more flexible career paths, allowing for fewer (but longer) assignments over the course of a career. These benefits would have to be weighed against the original motivations behind the relevant provisions of DOPMA. These are longstanding traditions—mandatory retirement at 62 has been the law since the Civil War, and up-or-out has been official Navy policy for more than a century. How well they meet the current and future needs of the Military Departments is unclear.

It should be noted that there are intermediate alternatives between the status quo and elimination of all DOPMA provisions. Schirmer et al. (2006) studied the question of how DOPMA could be modified to increase flexibility in career paths, and made several recommendations, including increasing the maximum number of assignments without promotion from two to three.[107] It might also be possible to eliminate or modify DOPMA only within the acquisition career field or even more narrowly to only the program management career field as is done with doctors and chaplains, perhaps in conjunction with establishing a separate competitive category. This would mitigate any perceived harmful side effects of changing the age distribution and career paths of line officers in command assignments.

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[106] DBB, "Review of DoD's Program Managers."

[107] Peter Schirmer et al., "Challenging Time in DOPMA: Flexible and Contemporary Military Officer Management," MG-451-OSD (Santa Monica, CA: The RAND Corporation, 2006), https://www.rand.org/pubs/monographs/MG451.html.

c. Do Not Reinstate Dual-Track Acquisition Careers

Avoiding dual tracking of military occupational specialties would be an important element in successfully changing the military culture affecting program management and acquisition career progression. There is no reason to believe that part-time non-specialists can be top-quality program managers, any more than part-time doctors, chaplains, or attorneys can function at top levels in those specialties. As noted earlier, single-track acquisition specialists have historically been perceived—rightly or wrongly—as being at a disadvantage for promotion relative to their dual-track fellow officers. As a result, during times when dual-track careers were available, most officers in acquisition career fields opted for the dual-track path, spending a large fraction of their service time in postings unrelated to acquisition. That might work reasonably well for logisticians or financial analysts, but it is a recipe for disaster for those attempting to be contracting officers or PMs of major programs. Up-or-out promotion reinforces the penalties of single-track acquisition careers by making it more likely that officers specializing in an acquisition functional area would be forced to retire for failure to be promoted.

Given the realities of historical military promotion preferences, the absence of dual-track acquisition careers would probably not affect the ability of the Services to attract and retain quality PMs. However, line officers in command tracks and officers with combat experience would continue to be more highly valued by the Military Departments. Eliminating the dual-track option would need to be combined with guidelines or explicit quotas for promotion rates of Acquisition Corps officers, or with the establishment of a new competitive category as described above. Current law stops short of requiring explicit promotion quotas, but all of the Military Departments currently develop annual promotion count targets by career field, as the Navy promotion board example from Chapter 2 shows.

The impact of a lack of a dual track career path on the recruitment of officers into the program management career path, or into any of the other functional specialties within the acquisition workforce, is unclear. Those officers who were interested in program management but were deterred by a fear of being at a disadvantage for promotion would be more incentivized; those who were only willing to study acquisition if they could also experience operational assignments and commands would be disincentivized. We are not aware of any analysis indicating which of these factors would predominate. For those officers who did follow the PM career path, we would expect retention to decline if dual-tracking were reinstated.

The Military Departments have historically argued that there is a positive benefit to dual tracking, in that operational and command experience makes officers better PMs. There is very little empirical evidence to support this claim, and it is contradicted by commenters in industry who complain that the PMs they work with do not have the necessary skills, and are transferred away before they ever become proficient on the programs they are managing. We suspect that the best preparation for being a PM is a long

and stable career focused on program management, and that additional experience in the field of program management is a better enabler than spending that time in non-acquisition assignments, being evaluated on criteria unrelated to program management. That may be even more important if the concept of the "smart buyer" described in Chapter 7 is looked upon with favor.

d. Establish a Well-Defined Career Track for PMs

Several of the policy options discussed above are intended, at least in part, to establish a more well-defined, predictable, and self-selected career path for military officers in the program management career path. Creating a separate competitive category, avoiding dual-tracking, and ending up-or-out would all contribute to this. There are additional policy options that are less sweeping but that could be used to enhance the stability, attractiveness, and effectiveness of PM career paths.

1) Allow Promotion in Place for PMs

One of the benefits of avoiding dual tracking and/or creating a separate competitive category for acquisition or for the program management portion of it would be that the sequence of assignments in acquisition careers would become more predictable and better suited to steady development of expertise. Even within the current system, other ways to regularize the expected sequence of assignments and increasing authorities could be emphasized. One such way would be to allow promotion in place for program management professionals. This would reduce the disruption of programs through continual churn of management personnel without penalizing individual PMs by delaying or reducing their chances of promotion. It would permit the PM to satisfy his or her commitment to the CAE to stay in the PM position for the entire statutory amount of time.

2) Give PMs Authority to Recruit, Retain, and Manage their Staffs

In private industry, a key enabler of project success is the establishment of proven teams that persist over time. The current system of promotion and assignment under DOPMA essentially makes it impossible for military officers to remain part of a team for more than a few years; dual-track career paths would make this even worse. As a result, no team ever develops exceptional competence, and a great deal of program management effort goes into bringing new people up to speed and replacing lost expertise in the Program Management Office.

If PMs had the ability to recruit and retain specific military officers to serve on project teams over extended periods of time, this would almost certainly enhance Program Management Office capabilities and performance. It would also provide a greater incentive for quality officers to serve as PMs, knowing that they would have the ability to build and retain a staff of their choosing. Of course, this would need to be done in a way that did not

impair the promotion or career progressions of either the PMs or the staff officers. Although such an idea might not be feasible given military assignment practices (the PM could be rotated out of the position by the time they had their military team together), civilian staffing is often done by matrix assignments of civilian functionals to the Program Management Office from either the PEO staff or from the sponsoring command. Matrixing may be an effective method of minimizing dedicated staff, but it introduces potential conflict between the source chain of command and the PM as to which has control over the matrixed employee. The PM must have a staff that reports only to them, not to a boss within the matrix.

3) Give PMs the Ability to Choose Assignments

The Military Departments have long understood that the ability to choose assignments can be a highly motivational incentive for military officers. For example, in 2017, the Air Force implemented a program in which eligible officers and enlisted airmen who volunteered for an extended 365-day deployment could get preference for an advanced assignment or a return to a home station with a two-year permanent-change-of-station deferment.[108] Similar programs exist in the other Services, on an ad hoc basis.

Giving officers in the program management career path preferential ability to choose assignments relative to other career paths, could be a powerful incentive for recruiting and retaining officers into the PM career path. These preferences could apply to current assignments, or to follow-on assignments (e.g., for PMs who accept unpopular or difficult current assignments). The downside of such a program is that it is difficult to give everyone their first choice if there is general agreement regarding which positions are preferable. If the preferences were awarded on the basis of performance, all of the difficulties associated with merit-based incentives would apply (see section 6.C for a more detailed discussion of this). A lottery-based approach might offer a good compromise, with officers available for assignment choosing their preferred positions in randomly assigned order. This would tend to spread the benefit evenly over time, but all officers would get (on average) some opportunity to choose preferred postings over the course of their careers.

B. Civilian Incentives

1. Financial Incentives

Given the dynamics and constraints of the civilian pay system, there is potentially a broader range of policy actions available to create financial incentives for the purpose of

[108] Charlsy Panzino, "Airmen who Volunteer for Extended Deployments Can Choose their Follow-On Assignment," Air Force Times, May 25, 2017, https://www.airforcetimes.com/news/your-air-force/2017/05/25/airmen-who-volunteer-for-extended-deployments-can-choose-their-follow-on-assignment/.

attracting and retaining civilian PMs than for military officers. These policy alternatives include higher base pay, merit-based payments, competition within a merit-based pay scale, and optional performance bonuses.

a. Higher Pay Scale

As shown previously, average compensation for DoD civilian PMs is significantly lower than for similar PMs in the military and in private industry. Establishing a separate, higher pay scale for acquisition professionals, and for the program management career track in particular, could incentivize more and better civilians to pursue such careers.

Some efforts in this direction have already been made. AcqDemo, introduced in 1999, established an alternative personnel system for managing civilian acquisition workforce employees. This system allows for streamlined hiring mechanisms, potential performance bonuses, a system of flexible pay bands with merit-based promotion, and additional authorities to hire a limited number of people at salaries well above the usual caps for GS or SES employees. While still technically a "demonstration program," AcqDemo has been extended and expanded by the Congress several times since its inception. Currently, the program is authorized to run through FY 2023, encompassing up to 130,000 acquisition civilians at a time.[109] DoD reports that retention rates for employees under AcqDemo have been nearly 25 percent higher than for GS acquisition personnel.[110] Expanding AcqDemo further and/or making it permanent would almost certainly enhance future recruiting and retention of civilian acquisition personnel.[111]

While AcqDemo provided greater flexibility than GS and (in some cases) SES compensation and employee management, we saw in Chapter 2 that the overall compensation of employees under AcqDemo is still not competitive with either private industry or military officer compensation in similar roles. Under current law, there are other limited authorities within DoD to employ civilians at significantly higher salaries than the usual statutory schedules. The NDAA for FY 2004 gave the Secretary of Defense authority to hire up to 2,500 civilian employees to be designated "highly qualified experts" (HQEs) at pay rates considerably higher than the usual civilian scales.[112] Later legislation emphasized that using this authority specifically to improve the acquisition workforce is

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[109] There are currently fewer than 50,000 employees under the AcqDemo system.

[110] *Civilian Acquisition Workforce Personnel Demonstration (AcqDemo) Project; Department of Defense (DoD).* Federal Register, 82 FR 32056, 11 July 2017. https://www.federalregister.gov/documents/2017/07/11/2017-14251/civilian-acquisition-workforce-personnel-demonstration-acqdemo-project-department-of-defense-dod.

[111] AcqDemo was a model for what would have been the National Security Personnel System for all DoD civilian personnel. It has been implemented within the acquisition community even though it has not had universal acceptance.

[112] Pub. L. No. 108–136, 24 November 2003, codified at 5 U.S.C. §9903.

consistent with congressional intent.[113] To date, DoD has not made effective use of this authority; in June of 2016, Secretary of Defense Ashton Carter noted that only about 90 of the available 2,500 HQE positions were currently filled.[114] One reason for this may be that HQE positions are explicitly temporary—individual HQE appointments last for a maximum of five years, with a single one-year extension available in exceptional cases. The program is not intended to incentivize careers in acquisition or program management; instead, it is intended to provide temporary infusions of talent and expertise to existing organizations and workforces.

This suggests a potential policy alternative: modifying or supplementing the HQE program with hiring authorities that are intended to incentivize longer-term commitments to public service by individuals with significant program management expertise. As with the existing HQE program, this could be combined with increased lateral hiring authority. Given the importance of MDAP program management, this would seem to be a sensible and cost-effective option.

b. Increased TSP Matching

The Thrift Savings Plan (TSP) is the defined-contribution retirement savings plan for federal employees, similar to a 401(k) plan in its implementation. Under current law, employees may divert up to $18,500[115] of their before-tax wages into their TSP account. The employing Agency contributes a mandatory 1 percent of gross wages, plus up to an additional 4 percent of gross wages in matching contributions.[116] By law, the maximum total combined contributions of the employee and Agency must not exceed $54,000. However, a GS-15 step 10 contributing the maximum amount to TSP and receiving

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113 10 U.S.C. §1705(f)(2) Department of Defense Acquisition Workforce Development Fund.

114 Office of the Secretary of Defense, "The Next Two Links to the Force of the Future," Memorandum, June 9, 2016.

115 $24,500 for employees over 50 years of age making so-called "catch up" contributions in addition to their base contributions.

116 See Internal Revenue Code sections 402 and 415: Civilian employees under the Federal Employees Retirement System (FERS) are eligible to join TSP and receive matching contributions from their Agency. Employees under the older Civil Service Retirement System (CSRS) are eligible for the TSP but are not eligible to receive Agency matching contributions. An employee contributing 3 percent of their base pay receives an additional 3 percent matching contribution (dollar-per-dollar matching contribution on the whole 3 percent) plus an additional 1 percent Agency automatic contribution—total Agency contribution is 4 percent. A FERS employee contributing 4 percent of their base pay receives an additional 3.5 percent matching (dollar-per-dollar matching contribution on the first 3 percent, plus .5 percent for the fourth percent contribution) plus an additional 1 percent Agency automatic contribution—total agency contribution is 4.5 percent. A FERS employee contributing 5 percent of their base pay would receive an additional 4 percent (dollar-per-dollar matching contribution on the first 3 percent, plus .5 percent for each of the fourth and fifth percent contributions (making 1 percent total)) plus an additional 1 percent Agency automatic contribution—total Agency contribution is 5 percent. Military members are also eligible for TSP.

standard agency matching would not come anywhere near $54,000 in combined contributions.

2. Non-Financial Incentives

As noted earlier, non-financial incentives are very important factors for public sector PMs, including intrinsic job responsibilities and the prospect of overall project success in the public interest.

a. Use More Civilian PMs on Major Programs

At present, very few MDAP PM positions are awarded to civilians. Civilian members of the acquisition workforce know this, and are in general reluctant to pursue MDAP PM positions, given that they view their chances of being selected as slight; additionally, they can be assigned as the Deputy PM, and not have the stress that comes with the PM assignment. One of the largest changes that could be made to recruit civilian PMs would be to award a significant fraction of higher-level PM positions to civilians.

Unlike the other policy alternatives described in this chapter, the best implementation mechanism for this is not clear. The Military Departments have shown a strong preference for military PMs, to the extent of frequently declaring MDAP PM positions to be military-only. This has at least in part been because of the belief that military personnel better understand the operational environment and can communicate more effectively with the range of stakeholders with whom the PM must interact. This preference has also played out in the decisions of both project manager and PM selection boards. In essence, the Departments would be assigning more MDAP PM positions to civilians contrary to their judgment. Awarding more PM positions to civilians would thus require OSD-level or congressionally imposed oversight, quotas, and other awkward and adversarial mechanisms. Such attempts to impose culture seldom work well, but how the Congress could get the Military Departments to value civilian PMs equally or above military PMs is not clear.

b. Enable Lateral Hiring

A severe limitation of the current system for developing PMs has been that they must in essence be grown from entry level personnel. Section 502 of the NDAA for FY 2019 amends 10 U.S.C. §533(b)(2) to broaden the applicability of the service credit upon original appointment as a commissioned officer from exclusively a doctor or dentist to any individual that meets the requirements for appointment—such individuals can now be commissioned at the grade of O-6 rather than O-4 as was the original statutory construction. Such constructive credit remains subject to the Service Secretary's designation of program management as one of those functional areas for which constructive credit can be given. However, as Chapters 2 and 5 discuss, individuals with the skills to be an O-6 PM can

expect to take a substantial pay cut moving from industry to DoD. Further, those that are laterally hired will generally not have satisfied the certification requirements of DAWIA.

The military has been laterally hiring trained physicians, dentists (10 U.S.C. §533), chaplains, and attorneys from the private sector to enter as military officers. It would be beneficial to the acquisition workforce if there were a similar way to hire already trained acquisition professionals at various levels of experience, either temporarily or permanently. The provisions of Section 502 of the NDAA for FY 2019 may provide that authority.

DoD has recently implemented a pilot program that provides a model for professional exchange of personnel. The DoD Industry Exchange Program places mid-career civilians (GS-13–15 or an AcqDemo-equivalent pay band) in the program management, engineering, logistics, science and technology, and contracting business domains into temporary details with a selection of prominent defense contractors. At the same time, experienced managers and technologists from those companies work within acquisition workforce roles within DoD.

c. Enhance PM Career Determination

For military officers, the ability to establish a well-defined, predictable, and self-selected career path is valuable: it is equally valuable to civilians—perhaps even more so, given the cultural differences between military service and civilian service. Several potential policy actions could enhance both the perception and the reality of career self-determination and stability for civilian PMs.

1) Give PMs More Ability to Choose or Refuse Assignments

The need to relocate in order to accept a position is a stronger disincentive for civilians than for military officers. Military officers join their respective Services in full knowledge that they are signing up for a series of temporary assignments, some of them potentially in far corners of the world (or aboard ships for long periods of time). Their families plan for this, and to some extent have adapted to it. There are support services for military spouses and families left behind during deployments. This is not generally true for civilians.

As a result, civilians are generally less willing to accept jobs that would take them far away from where they currently live, for an unknown period of time, with an uncertain set of job options available at the end of that time and with another move imminent. Because PM positions are designed around military careers, they are generally time-limited—meaning that a civilian PM can expect to be term-limited for four years and looking for a new job, in an uncertain location, after the conclusion of the PM term. This term limitation is also self-defeating if the Department is looking for civilian PMs to overcome the lack of stability and experience resulting from constant military rotations. At the same time, under

current practice, civilians are penalized for expressing interest in being a PM, declining unattractive offers, or only rarely applying for PM positions.

If increasing the number of experienced civilian MDAP PMs is a goal, making PM assignments more attractive to civilians seems like a natural policy option. One way to do this would be to reduce the potential downside to applying for a PM position. Another would be to offer high-performing civilian PMs more ability to choose their assignments, which would allow them to better balance personal and family-based considerations against the attractiveness of the specific job in question. A third option might be to commit to greater geographic stability for civilian PMs across multiple program assignments, guaranteeing them that their next position would also be in the same geographic location as the one for which they are being invited to apply.

2) Give PMs More Authority to Recruit, Retain, and Manage Staff

As noted above, private industry values the ability to establish proven teams that persist over time. Even though they are not subject to the vagaries of DOPMA, civilian PMs do not have much authority to recruit, organize, and manage their Program Management Office staff—particularly not the military officers serving in those roles. They may also have less leverage to pry top performers from their matrix bosses.

If civilian PMs had the ability to recruit and retain specific military officers and civilians to serve on project teams over extended periods of time, perhaps even persisting from one project/program to the next, this would almost certainly enhance Program Management Office capabilities and performance. It would also provide a greater incentive for experienced and dedicated civilians to serve as PMs, knowing that they would have the ability to build and retain a staff of their choosing. As before, this would need to be done in a way that did not impair the promotion or career progressions of military officers, suggesting that this approach might work best in conjunction with one of the alternatives that establishes a non-line military career track for acquisition.

C. Merit-Based Incentives

1. Financial Incentives

It is a common assumption that merit-based incentives (rewards) are the best mechanism for attracting PMs and motivating them to manage their programs effectively and efficiently. Indeed, section 841 of the FY 2018 NDAA establishing this study explicitly requires an investigation of "a financial incentive structure to reward program managers for delivering capabilities on budget and on time." There are numerous potential ways, financially and otherwise, that exceptional PMs could be rewarded. These include:

- Spot bonuses (military)

- Defense Acquisition Workforce Development Fund (DAWDF) recruiting incentive bonuses and reimbursement (civilian)
- AcqDemo-like merit-based bonuses and pay bands (civilian)
- Merit-based ability to choose positions or staff (military and civilian)
- Additional medals and commendations (military and civilian)

Unfortunately, performance-based rewards can have significant unintended consequences when they are applied in the wrong context.

In the following discussion, we borrow heavily from two labor economics papers—Lazear and Shaw (2007)[117] and Rebitzer and Taylor (2011)[118]—on the pros and cons of using performance-based pay (or other performance-based incentives) to motivate employees. A key requirement for successful implementation of performance-based rewards is that *it must be possible to measure performance accurately*. For example, Lazear and Shaw compared hedge fund managers with commercial bankers. It is relatively straightforward to measure the success of hedge fund managers by looking at the returns their investments generated,[119] so performance-based pay is common and successful in this industry. In contrast, the success of commercial bankers' portfolios typically cannot be assessed until several years after the portfolio was selected. As a result, commercial banks typically pay a salary and rely on credentials such as education and experience to identify and retain high-performing workers.

The PM career field is much more like commercial banking than hedge fund management. The effect of actions taken by PMs in the present may not be apparent for many years—oftentimes, long after the PM has moved on or retired. Worse yet, PMs have much less control over program outcomes than is generally recognized because a contractor, not the DoD PM, manages the program. The DoD PM does not have authority to set requirements, set budgets, or set schedules, but is held accountable for failure to meet externally imposed targets for all three.[120]

Recognizing the challenge of accurately measuring PM performance is important because of the dangers of establishing rewards for performance that do not ultimately align with the organization's mission. Research has shown repeatedly that poorly specified

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117 Edward P. Lazear and Kathryn L. Shaw, "Personnel Economics: The Economist's View of Human Resources," *Journal of Economic Perspectives* 21, no. 4 (Fall 2007): 91–114, https://doi.org/10.1257/jep.21.4.91.

118 James B. Rebitzer and Lowell J. Taylor, "Extrinsic Rewards and Intrinsic Motives: Standard and Behavioral Approaches to Agency and Labor Markets," in *Handbook of Labor Economics*, Vol. 4 (Amsterdam: Elsevier, 2011), 701–72.

119 Even this is less straightforward than it sounds, because it is difficult to measure the degree of risk the manager accepted in order to generate those returns.

120 See, for example, Eckerd and Snider, "Does the Program Manager Matter?"

reward systems create perverse incentives—incentivizing workers to focus on obtaining the rewards rather than on achieving organizational objectives. In industry, PMs can be aligned with organizational objectives by rewarding them with a portion of the company profits. Industry PMs who carefully manage successful programs and quickly shut down poor programs that are destined to fail share in the higher profits their actions bring their companies. In contrast, there are no "company profits" to share with DoD PMs, so success tends to be measured in terms of (possibly unrealistic) cost and schedule targets, and with protecting the program from restructuring or cancellation. A rewards system focused on cost and schedule may encourage short-term optimization or high-risk gambles at the cost of the long-run success of the program. PMs are rewarded for stringing along doomed programs at great cost in time and money, and are punished for "giving up" on programs that had no chance to succeed.

In addition to the measurement problems and resulting perverse incentives associated with performance-based pay, economics literature also identifies significant unhealthy secondary effects of performance-based pay. Performance pay may actually decrease employee performance if not carefully applied. In particular, while performance-based pay can encourage workers who expect to be high-performing to select into a job, and motivate them to work harder, that depends on being able to compensate those workers at competitive rates. This is relevant in the context of program management, where the substantially higher salaries for PMs in industry mean that the workers who are most likely to be motivated by performance-based pay are unlikely to accept the lower salaries that come with a PM position in DoD, even with performance-based bonuses. If the size of these bonuses were increased until they were substantial enough to attract these individuals away from industry, the resulting high-stakes reward system would be even more susceptible to the perverse incentives discussed above.

We found substantial evidence that individuals in DoD's current PM career field, both military and civilian, are highly motivated intrinsically. For example, in our interview with Defense Acquisition University (DAU) students, they consistently reported motivations such as a "desire to lead" or "interesting challenges" as more important than the money. One student summed it up best as "meaningful work is the best incentive." Likewise, in surveys of the Army Acquisition Key Leadership Position (KLP) population conducted by the Acting Assistant Secretary of the Army (Acquisition, Logistics & Technology) (and Army Acquisition Executive), the top three motivators chosen by KLPs were "desire to make a difference or lasting impact" (83 percent of 253 surveyed), "desire to lead" (71 percent), and "desire to serve" (66 percent). In contrast, "increased pay" and "career recognition" were each chosen by only 24 percent of those surveyed. Rebitzer and Taylor (2011) make the important point that "pay policies can affect intrinsic motivation, often in

surprising ways."[121] Lazear and Shaw (2007) demonstrate that when the levels of intrinsic motivation vary among workers, "those who value intrinsic internal motivation more than extrinsic rewards will gravitate towards jobs with salary or wage-based pay."[122] In DoD's acquisition environment, where the workforce is highly intrinsically motivated, there is a significant risk that a structured rewards system would be unappealing to the very PMs DoD is trying to attract and retain, and would cause the current incumbents to distrust their new co-workers' motives.

2. Non-Financial Merit-Based Incentives

While non-financial incentives may avoid some of the concerns about mercenary behavior and dilution of the workforce's commitment to the mission, they do not entirely avoid them. The problem of measurement remains—the morale damage done by a reward system that is seen by the workers as inaccurate or arbitrary can more than offset any benefits in diligence that it might produce. This is just as true of minor perks like corner offices and convenient parking spaces as it is of major cash awards and promotions.

3. Commendations and Medals

The military has a long tradition of awarding medals and commendations for performance "above and beyond the call of duty." This tradition has been carried over, to some extent, to the civilian side of DoD, as noted in section 2.C.2.

In our conversations with current DoD acquisition workforce personnel, both military and civilian, we found that medals and commendations associated with performance of acquisition-related duties were not highly valued or respected. In contrast with medals awarded for operational duties (and especially combat-related duties) or commendations for visible and substantial public service, acquisition-specific medals and commendations were not a significant motivational factor for the part of the workforce we interviewed.

In part, this is tied to the measurement problem noted above. The criteria for being awarded a Distinguished Flying Cross or Bronze Star are well understood, and reflect shared values of the armed forces. The criteria for being awarded a commendation for bureaucratic effectiveness are not well understood, and there is skepticism among the workforce about the ability of those doing the awarding to really distinguish who the most valuable performers have been. As a result, such commendations are not necessarily seen as indicative of excellence, and as such are not always highly valued—even by their recipients. That seems counter-intuitive, as a Legion of Merit medal is a valued award for those in operational fields as well as those in supporting organizations.

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[121] Rebitzer and Taylor, "Extrinsic Rewards and Intrinsic Motives."

[122] Lazear and Shaw, "Personnel Economics."

7. Concluding Thoughts

We have focused our efforts in this research on the consideration of the pros and cons of potential incentives to recruit, retain, and reward program managers. This paper is another in a long line of studies evaluating this and similar questions. In combination, these studies provide only weak evidence that these incentives will have any impact on the actual tenure of PMs.

Likewise, the study guidelines laid out in the NDAA for FY 2018 implicitly assume that increasing the tenure of PMs will have a positive effect on program outcomes such as cost and schedule. As Eckerd and Snider (2015) showed, this assumption is not necessarily true; powerful stakeholders leave PMs with mostly "nominal" influence over their assigned programs.[123] The DBB (2011) at least partially supported the same conclusion when it reported that military PMs spend too much time managing the politics and the "process" within DoD rather than managing their specific program.[124]

If the real goal is to improve program outcomes, there are likely to be more effective mechanisms than simply increasing the tenure of PMs. For example, DoD could pursue an acquisition model and a PM career progression path similar to the one described below centered around "smart buyers."

- *Credible "smart buyers"—such as the senior PEOs and PMs—could provide the counterweight that helps to overcome the institutional and political pressures to overpromise at the outset of programs.*

  Programs make unrealistic promises, because that is what it takes to build the coalition to permit the program to proceed. On the contractor side, in the cost-plus environment, the cost offered need only be conceivably and optimistically possible, not probable to a reasonable probability of certainty. So, an overrun is typically built into the unrealistic estimates from the start. One counter to this lack of realism—which experience shows is a root cause of problems for many programs—is to establish PEOs and program management leadership teams made up of "smart buyers," who have strong professional incentives to set realistic expectations. One of their professional duties would be to serve as advocates for realism in the formulation and execution of programs. To be able to accomplish these crucially important tasks, acquisition executives must have

[123] Eckerd and Snider, ""Does the Program Manager Matter?"

[124] DBB, "Review of DoD's Program Managers."

the experience, expertise, and professional gravitas to enable them to provide a credible, independent voice in the face of Executive Branch or congressional pressures. A career management model would provide a mechanism for achieving this.

- *Credible "smart buyers" can help to enforce realism in executing programs in the face of contractor "optimism."*

  The role of the credible "smart buyer" continues through the life of the program. There is an inherent mismatch of DoD-contractor incentives, as DoD wants to execute programs cost effectively while contractors will remain steadfastly optimistic in order to keep programs moving. The emergence of PowerPoint has introduced an element of fog into realism and expectations of success. The use of stoplight charts and risk mitigation plans can disguise many problems that will spring up unexpectedly to the unwary. A professionalized, credible leadership team could provide a counterweight to excessively optimistic program assessments. Such a counterweight would not guarantee better decisions in all cases, but could play a very constructive role in shifting the balance of decisions toward improved program outcomes.

- *A career progression model, with strong rewards for successful careers, could create the "smart buyer" culture needed to properly develop and incentivize PMs and PEOs to serve as counterweights to political and institutional pressures.*

  Individuals must believe that one's professional reputation for judgment and integrity is more important than is "looking good" on near-term program reports. The Packard Commission recommended, without using the term, a professionalized community of "smart buyers," buyers who were beholden to the values of their professional community. A review of the acquisition community chain of command proposed by the Packard Commission (PM → PEO → SAE → DAE) shows the parallels.[125] It is noteworthy that, while the Commission argued for greater pay flexibility to improve the quality of the acquisition workforce, and it argued for greater autonomy for highly capable acquisition managers, it did not make specific recommendations on the career development of acquisition personnel.

[125] President's Blue Ribbon Commission on Defense Management, "A Quest for Excellence: Report of the Blue Ribbon Commission on Defense Management" (Washington, DC: The Commission, 1986).

- *Professionalization of the PM-PEO community would also facilitate regulatory reform.*

  Professionalized "smart buyers" would not require the same specificity of regulations and directives. DoDI 5000.02, for instance, has become increasingly detailed over the last 30 years. A professionalized PM/PEO community might not need as much detail to inform its members how to operate within the DoD acquisition system. Because of their experience, and the career incentive structure, senior acquisition personnel would be positioned to make proper decisions based upon real experience.

Industry best practice has shown another important practice for maintaining a healthy portfolio is to identify and fail unsuccessful programs quickly. Keeping a failing program alive does not, on average, improve the survivability and ultimate success of the program—rather, private companies have recognized that unsuccessful programs are a drain on company resources. Killing a bad program quickly frees up these resources to try again on a new program that has a better chance of success. It is in the best interest of private companies to reward PMs who "fail quickly." DoD programs, on the other hand, have powerful stakeholders who are deeply invested in their success, and stakeholder resistance can keep a failing program on life support long after it should have been terminated. Secretary of the Army Mark Esper broached this topic in a 2018 interview discussing plans for the Army Futures Command.[126] He noted that in the past, failures tended to come after a huge amount of work, and it was worth considering changing the acquisition culture to "fail early and fail cheap." Creating policies and a culture that supports "failing quickly" would be a substantial challenge, but the payoff to the overall outcomes of the entire MDAP portfolio would be considerable. PMs that recognize and terminate inefficient and ineffective programs should be valued as highly as PMs that manage successful programs.

[126] Ian Livingston, "Order from Chaos: Secretary Mark Esper and the Future of the U.S. Army," Brookings, June 25, 2018, https://www.brookings.edu/blog/order-from-chaos/2018/06/25/secretary-mark-esper-and-the-future-of-the-u-s-army/.

Appendix A.
Tenures of MDAP Program Managers

To observe historical tenure of Major Defense Acquisition Program (MDAP) program managers (PMs), we obtained data from December 1997 to December 2017 on 705 PMs of 202 MDAPs from the Selected Acquisition Reports (SARs) stored in the Defense Acquisition Management Information Retrieval (DAMIR) System.[1] Specifically, each SAR lists the name, contact information, and assignment date of the PM at the time the SAR was produced. The prefix for each name identified either the rank, for military PMs, or the title (e.g., Mr., Ms.), for civilian PMs, enabling us to identify each PM's personnel type (military or civilian). From the assignment dates, we were able to construct a timeline of PMs for each program. Because the SARs are only submitted once each year, it is possible that the timelines we constructed missed a few PMs who may have very briefly served in between the end of one SAR and the assignment date of the PM who is listed on the subsequent SAR. In these cases, the timelines will overstate the tenures of the PMs immediately preceding the "missing" PMs.[2]

Table A-1 shows the distribution of MDAPs and PMs across the Services from the DAMIR data. We observe a total of 705 PMs for 202 past and present MDAPs. Seventeen percent of these PMs are civilians. Of the Services, the Air Force currently has the highest percentage of civilian PMs (36 percent), although the Navy has the highest number of civilian PMs over the whole sample (24 percent). About half of PMs for (the relatively small universe of) DoD-wide programs have been civilians.

[1] SARs are annual comprehensive status reports that each MDAP is required to submit to the Congress.

[2] For example, suppose there are three PMs: Amy, Bill, and Carl. Suppose the December 2000 SAR reports Amy as the PM with an effective date of January 1, 2000, and the December 2001 SAR reports Carl as the PM with an effective date of June 1, 2001. If Bill served as PM from January 1 to May 31, 2001, then his tenure is not reported on any SAR, and our constructed timelines incorrectly assume that Amy served as PM from January 2000 until Carl's start date in June 2001.

Table A-1. Summary of MDAPs and PMs by Service from December 1997 to December 2017

	Current Programs			All Programs (12/1997 to 12/2017)		
	No. of Programs	No. of Military PMs	No. of Civilian PMs	No. of Programs	No. of Military PMs	No. of Civilian PMs
Army	17	15	2	64	166	23
Navy	40	34	6	63	183	58
Air Force	28	18	10	71	227	29
DoD-wide	2	1	1	4	9	10
Total	**87**	**68**	**19**	**202**	**585**	**120**

Figure A-1 shows the distribution of tenures for completed MDAP PM positions by personnel type. The tenure distributions are very similar between military and civilian PMs. Half of the 82 civilians PMs served less than 2.92 years, with 75 percent serving 3.92 years or less. Half of the 390 military PMs served for less than 3.04 years, with 75 percent less than 3.95 years. Not surprisingly given the structured promotion process, military PM tenures tend to cluster around the 2-, 3-, and 4-year marks.

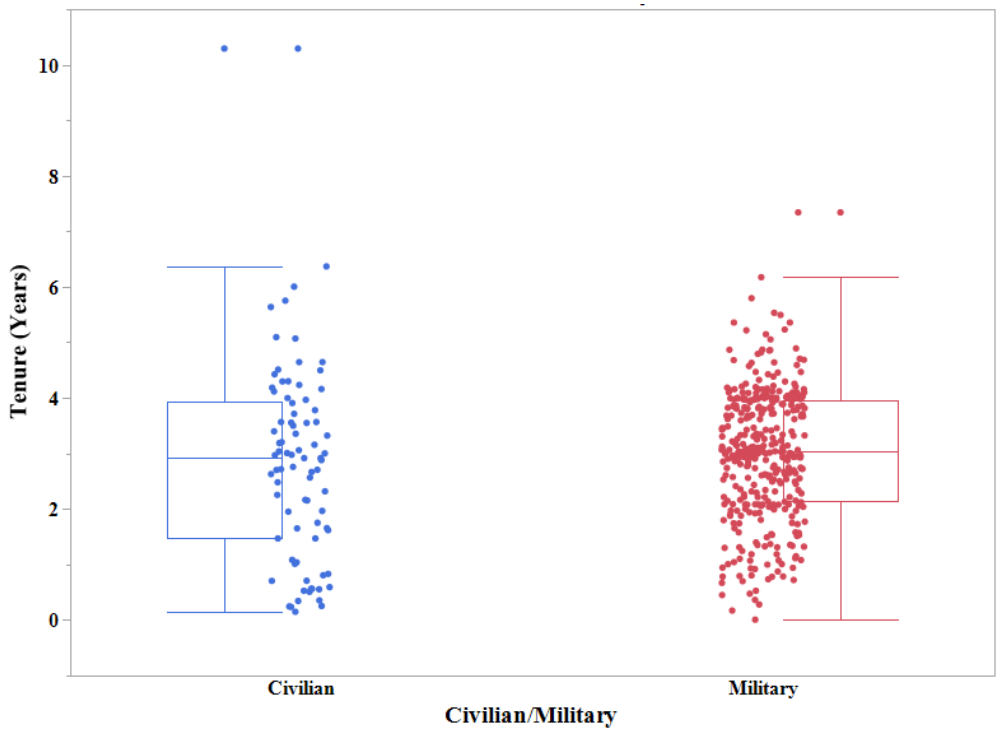
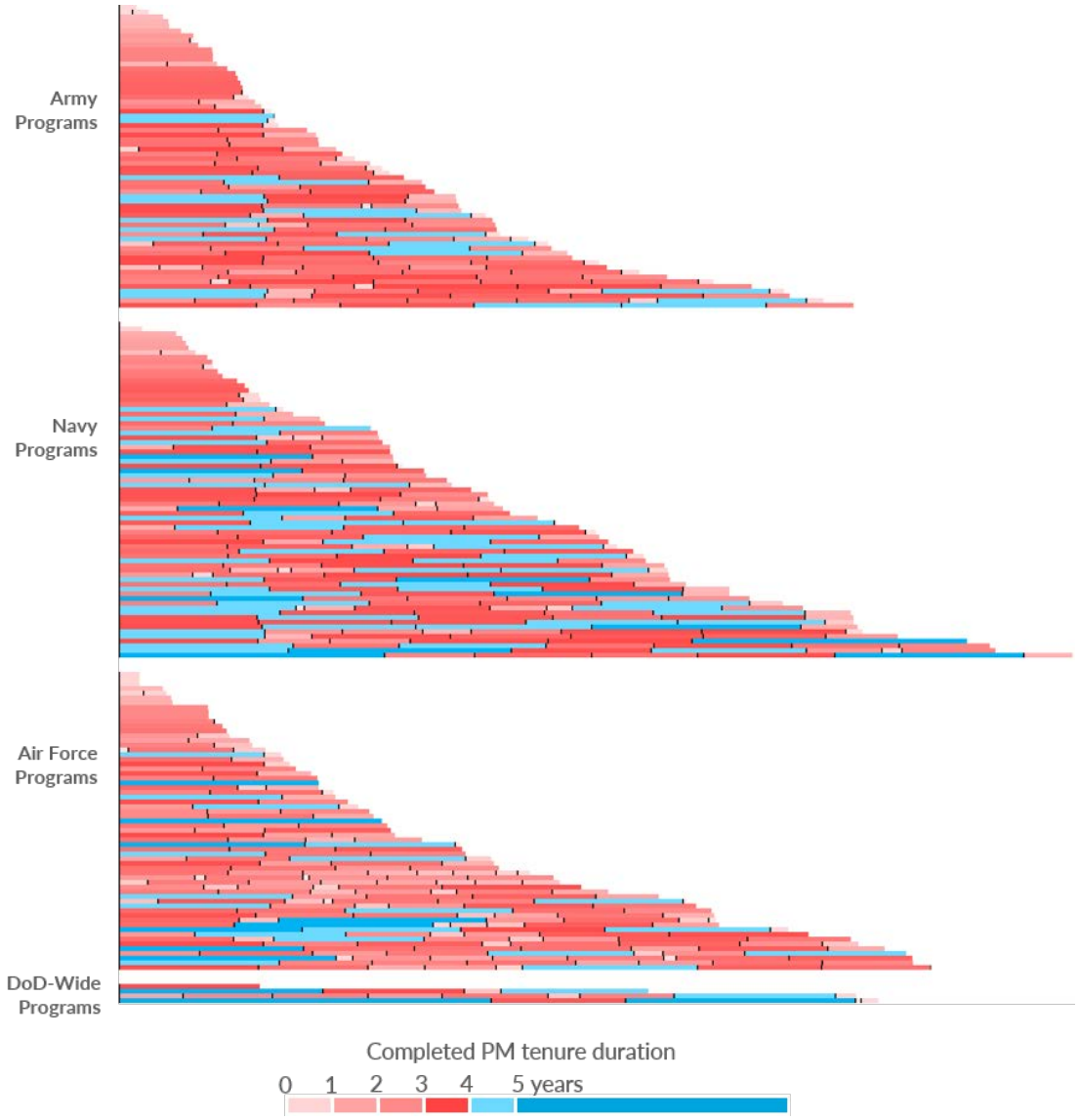


Figure A-1. Distribution of Completed Tenures for Civilian and Military MDAP PMs

Figure A-2 shows a heat map of completed tenure by Service, with the start of each new program aligned on the left and the start of each new PM position marked in black.

Red bars indicate PM positions that finished prior to four years, and blue bars indicate PM positions that lasted at least four years. This is consistent with the distributions shown in Figure A-1.



Note: Each row is a single program. Each shaded cell within a row represents the completed tenure of a single PM.

Figure A-2. PM Completed Tenure, by Service

Figure A-3 shows that most PMs leave before completing four years of service, and only a very few MDAPs have PMs that serve for more than five years. Figure A-3 shows how average time in position has changed over the last 20 years. In the top panel, each row represents a program, with the color of each bar growing darker as PMs serve longer; new

PMs are marked by lighter shades. The bottom panel averages the time in position for every MDAP PM at each moment in time.

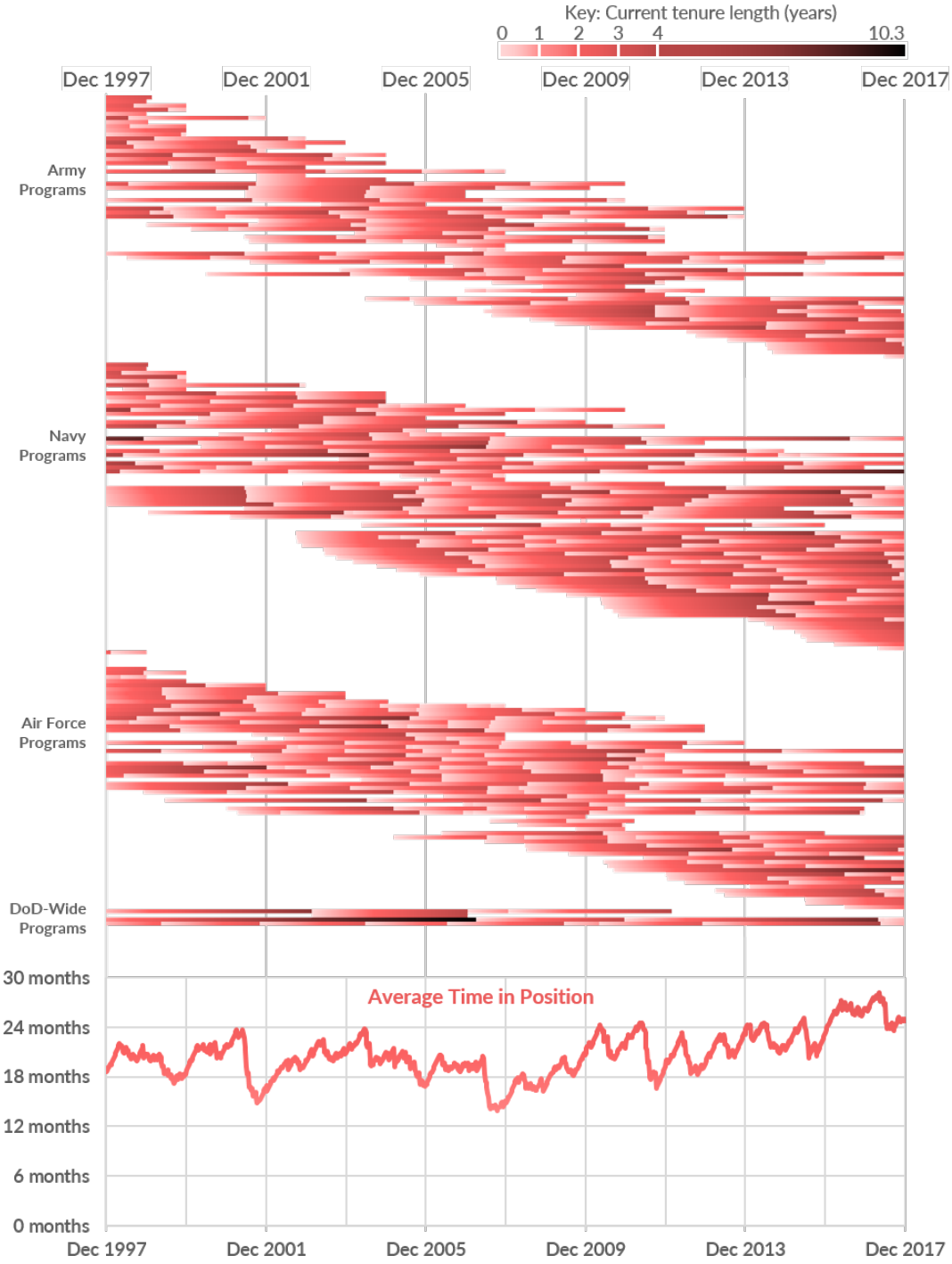
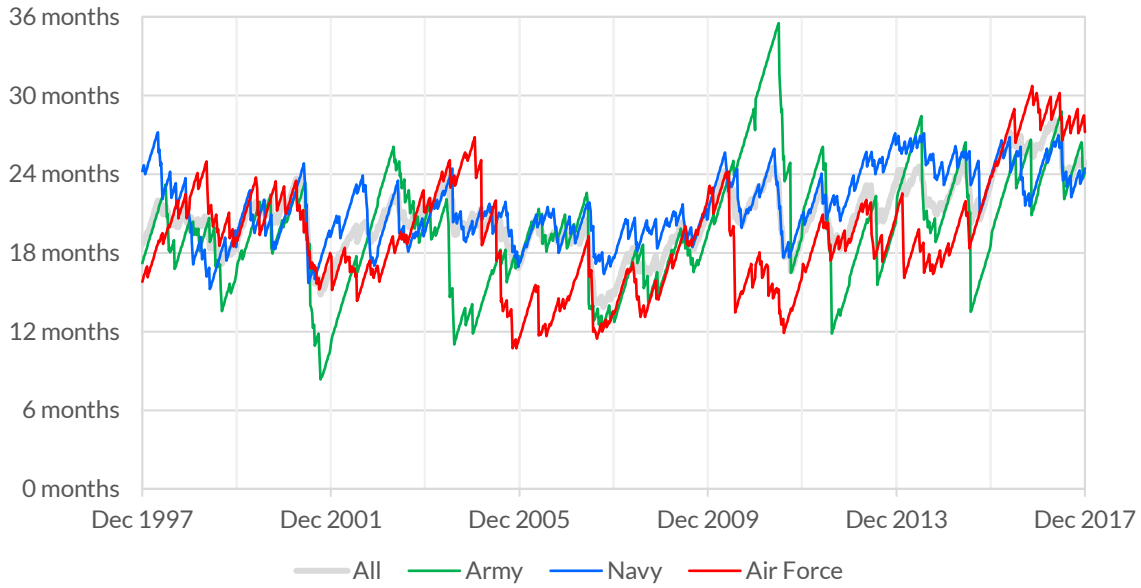


Figure A-3. Time in Position of MDAP PMs over Time

Figure A-4 shows the same data as the bottom panel of Figure A-3, except the average time in position is broken out by Service. Overall, the average experience of MDAP PMs has grown from about 18 months in December 1997 to about two years in December 2017. The Services averages show the same general trend.

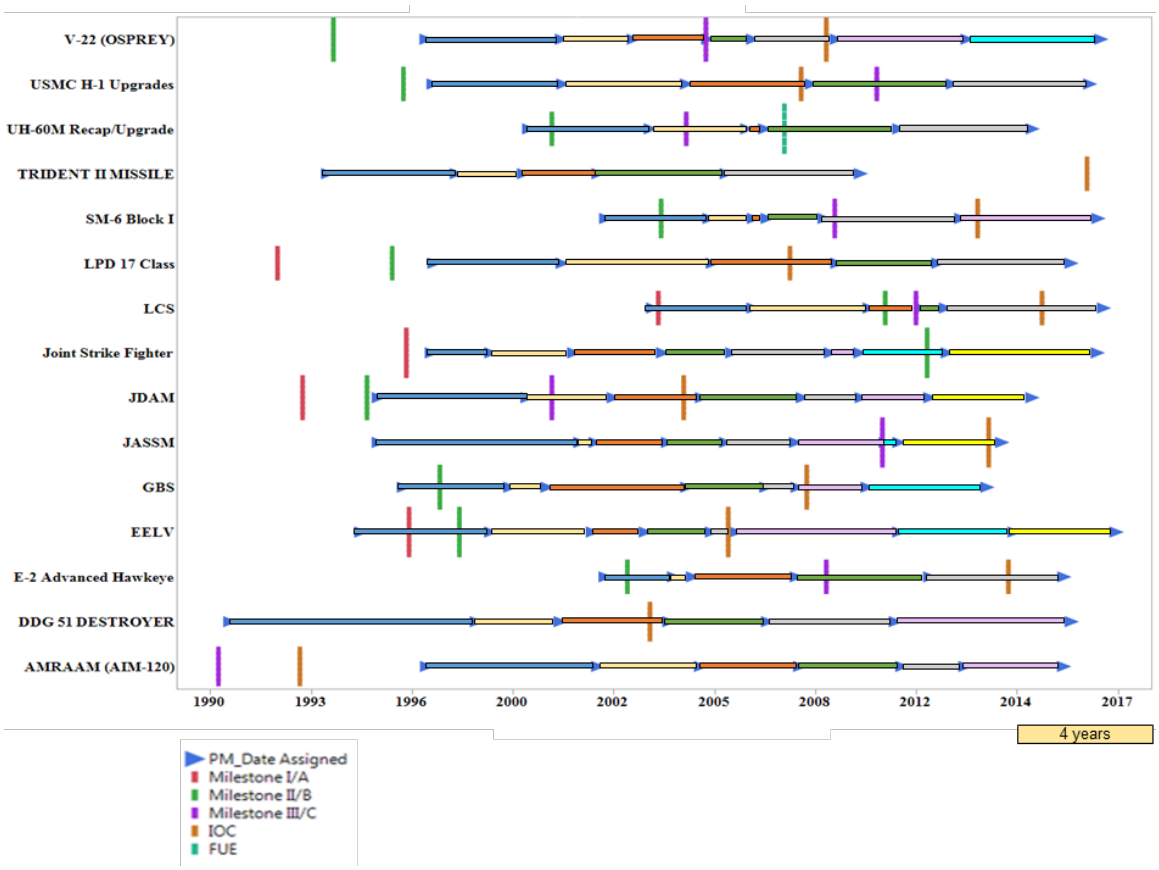


Note: Each line represents the averages of time in position for every MDAP PM within a Service at each moment in time.

Figure A-4. Average Time in Position of MDAP PMs over Time, by Service

The SARs also list past and projected milestone dates for each program. Since the milestones dates can slip over time, we collect data on completed milestones (i.e., milestones which occurred before the SAR date). Figure A-5 shows how these milestone dates compare to changes in PMs for 15 current programs.[3] Visually, it appears that while most PMs within four years of a milestone complete that milestone, many PM transitions are unrelated to upcoming milestones. For example, there were at least three PM transitions in the four years leading up to Milestone C of the Standard Missile-6 (SM-6 Block I) program.

[3] Specifically, these are the 15 current programs that are either ACAT I or IA, have at least six PM transitions, and have most of the program milestones.



Note: Only milestones that occurred since 1990 are shown. Also, when the same program milestone took place more than once, only the latest one is presented.

Figure A-5. PM Tenures Compared against Milestones for Selected MDAPs

We also calculated the fraction of PMs who started within four or five years before a milestone that reached said milestone. Table A-2 summarizes the results. The Army shows the greatest compliance with statute, with all 10 of the PMs serving within four years before Milestone B achieving it within their tenures, and 75 percent of the 16 PMs serving within four years before Milestone C achieving Milestone C within their tenures. On the whole, all but three (two military and one civilian) of the 49 PMs serving within four years before Milestone B completed Milestone B, but only 52 of the 65 PMs serving within four years before Milestone C reached the milestone. Of the 13 PMs who left before Milestone C, 11 were military (out of 57 military PMs serving within four years before Milestone C) and two were civilian (out of eight civilians serving within four years before Milestone C).

Table A-2. Percent of PMs who Reached Milestones if their Tenure Began within 4 or 5 Years before the Milestone

	Reached Milestone II/B if began within		Reached Milestone III/C if began within	
	4 years	**5 years**	**4 years**	**5 years**
Army Programs	100% of 10	100% of 10	75% of 16	75% of 16
Navy Programs	93% of 15	87.5% of 16	88% of 25	68.8% of 32
Air Force Programs	95.5% of 22	95.5% of 22	75% of 24	60% of 30
DoD-wide Programs	50.0% of 2	50.0% of 2	*No data*	*No data*
All Programs	**93.8% of 49**	**92% of 50**	**80% of 65**	**66.7% of 78**
Military PMs	95.3% of 43	93.2% of 44	80.7% of 57	68.7% of 67
Civilian PMs	83.3% of 6	83.3% of 6	75.0% of 8	54.5% of 11

Note: 100% of PMs who began within four years of Milestone I/A achieved it.

Appendix B.
Commercial Sector Interviews: A Comparison of Program Manager Development and Incentives

This appendix is based on IDA team interviews with private sector companies and addresses how major industries outside the defense sector approach program manager (PM) development and incentive compensation. The appendix also provides results of in-depth research team interviews with key commercial companies to assess the scope and efficacy of their approaches to PM development.[1]

Commercial Sector Interviews: PM Development and Incentives

Throughout the research team's interview process, issues of active program management and the relationship between PM development, career path progression, and financial incentives came to the fore. The research team conducted structured interviews to collect and assess information and data on the current financial and non-financial incentives that are being used in commercial sector program management.

A benchmarking interview process was utilized and applied across a range of commercial industries.[2] The methodology that was applied involved interviewing industry participants from four contrasting industrial sectors: automotive test and evaluation (T&E), software development, hospitality, and owner-developer project management/construction management (PM/CM). Companies interviewed ranged from one with less than 100 employees to one with more than 8,000 directors. This gave the research team a diverse cross-section of corporate environments to assess executive management approaches to both PM development and financial compensation.

An attempt was made to obtain answers to questions related to five key dimensions of program management:

- Approach: Does an approach to PM development exist? Is it considered to be formal, systematic, and documented, or more informal?

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1 The emphasis here is on recruitment, rewards, and retention, to include financial incentives.

2 Participants included, by sector: Engineering Software Development – Mathworks (Matlab and Simulink platforms); Automotive T&E – Nevada Automotive Test Center (military and commercial vehicles). Hospitality and Entertainment – MGM Resorts International ($Billion resort developments); Owner-Developer PM/CM – Mckissack & Mckissack (one of the 50 largest owner-developer project management and construction management firms in the United States).

- Deployment: If such an approach exists, where and to what levels is it deployed/utilized, including the senior PM level?
- Learning: Was there any change recently to the approach to improve it and make it more effective?
- Integration: How crucial is the approach considered to the organization's project/program outcomes?
- Career Path: Are there generic and or specific development paths for future PMs?

The research team's line of questioning against these five dimensions of program management cut across an extensive range of pertinent industry issues and factors, including:

- Program Management Development,
- Credentials Development,
- Career Path Development,
- Candidate Assessment,
- Performance Assessment,
- Use of Tenure Agreements,
- Mentoring,
- Benefits to Incentivize and Retain PMs,
- Geographic Limitations, Assignment Completion and Follow-on Assignments, and
- PM Turnover.

The results of the research team's structured interviews follow below.

How does your organization develop future PMs?

We found that approaches to PM development and retention varied by sector and by company size.

In the automotive T&E sector, smaller firms primarily hired PMs from outside of the company, often from a pool of retired government and industry PMs. This pool has an extensive base of experience that is considered necessary to overseeing clients and contracts within the sector.

Software development PMs are developed primarily internally through what is called *pragmatic training*. There are two types of software development PMs: Engineering

Development Managers and Product Managers. The latter interface with clients and handle the business side; they must be technically knowledgeable regarding the software and its applications, so their development path will often evolve from engineering development into product management. This approach appears consistent and critical to sustaining the company's market position.

Formal programs exist to develop new hospitality sector managers, but they are used primarily at the entry to middle management (operational/supervisory) levels. For example, a culinary associate program has been established in MGM Resorts' Management Associate Program.[3] At more senior levels, the approach is not as sophisticated. Cross training is used to help develop multi-disciplinary managers in order to improve their mobility within the company's functions; this is a recent innovative improvement. The program is effective to the point that graduates of the program at times will then leave the company for better compensation elsewhere. Front line operational and supervisory management performance is critical in this sector.

The Owner-Developer PM/CM PMs will be hired at the Associate PM (APM), PM, and Senior PM levels. New hires must have a relevant degree and some PM experience. There is no developmental path internally to become an APM. Degrees in engineering, architecture, or construction management, demonstrating subject matter expertise, are required. Experience with a general contractor, major sub-contractor, or architectural or engineering firm is also required. Staff with less than 10 years of relevant experience would be cast in roles as APMs. Some APMs have more than 10 years, especially on larger scale projects. APM career paths are tracked and an attempt is made by senior PMs to progressively develop APMs for the cross-disciplinary experience necessary to be able to qualify as a lead PM for a major project (over $50 million).

What is your credentials development program?

We then asked companies about the credentials they expected for PMs and those aspiring to become a PM. Once again, the qualifications needed to become a lead PM differed by industry:

For the automotive T&E industry, Project Management Professional (PMP) certification is considered a standard.

For the software development industry, a competency model is used. Product managers must have technical knowledge and experience with engineering development in their background. An attempt is made to promote from within but it is not an explicit requirement.

[3] A Hospitality Class in Prince George's County, Maryland, is provided for entry levels.

In the Hospitality industry, leadership skills are required, and qualified PMs are sought from both inside and outside the organization. Leadership best practices are sought as well.

The Owner-Developer PM/CM sector had the most formalized credentials development activity. Ten years or more of experience as an Associate PM or PM is generally required for smaller projects (projects less than $10 million). A Construction Management Certification (CMC, Leadership in Energy and Environmental Design (LEED) Certification, and Professional in Project Management (PPM) Certification all are deemed valuable. Some owners require that lead PMs have a professional engineering license. Knowledge of construction management best practices is associated with mastery of the following skill set:

- Contract Documents: Daily reports, monthly reports, photographs, payment requests, Owner directives, change conditions, field reporting, information systems, permit logs
- Schedule Management: Baseline schedule, schedule updates, three week look-ahead, schedule revisions, schedule reports
- Cost Management: Project budget, cost estimation, cost monitoring, schedule of values, change order control (entitlement review)
- Risk Management: Risk identification and register, mitigating actions, qualitative and quantitative analysis (cost of risk), continuous evaluations and reporting
- Safety Management: Written safety plans, safety audits, safety reporting
- Quality Management: Written quality control plans, audits, quality reporting, field walks.

How would you describe your company's career path development requirements?

The research team then asked the companies what the specific industry requirements were to continue in the career development path toward becoming a lead program PM. The four key requirements that were identified across each industry were ***education, training, certification, and assignments/experience***. The team also delved into the question of to what extent PMs could lead major programs.

In the automotive T&E sector, ongoing training, certifications, and experience are required. Currently 100 percent of capable PMs are running projects and programs. Five PMs (20 percent) at this smaller company could lead major programs.

In software development, what is called experiential-contextual internal on-the-job training occurs for the ongoing development of customer skills. The interviewee stated that a total of 75–100 out of a workforce of 3,000–4,000 could lead major programs.

The hospitality sector emphasizes leadership summits whereby the C-Suite goes on the road to push leadership principles to all leaders who are managing people, including high-level managers. Leadership modules of 45 minutes and engagement surveys are conducted. To remain a senior manager, ongoing assignments and experiences are necessary. A total of 8,000 directors at this company could lead major programs.

To continue as a lead PM in the owner-developer PM/CM company, PMs must keep their engineering and architect licenses current via continuing education. Ongoing training is also necessary, such as the adoption and deployment of new information systems and increased Occupational Safety and Health Administration (OSHA) training, etc.

Lead PMs are encouraged to work towards PMP and CCM certification. A total of 60–80 PMs out of a workforce of 150 could likely lead major programs. One hundred percent of capable PMs are currently running projects/programs. Lead PM positions can be difficult to fill, with demand high and supply limited.

What are your candidate and PM performance assessment programs?

The commercial industry uses a wide range of factors to assess overall PM performance. This set of interviews confirmed a consensus, industry-wide position that rotational assignments are not generally utilized.

- In the automotive T&E industry, the key factors are cost, quality, and schedule. Rotational assignments across programs are not utilized.
- In software development, a framework review template is used for all professional staff. There is no difference in this regard with respect to PMs. PMs will be moved and replaced if performance is not acceptable. Rotational assignments are not utilized.
- Hospitality gave no response on key performance factors. Cross-training is being considered in lieu of rotational assignments.
- The key assessment factors in the owner-developer PM/CM sector are cost, quality, and milestone schedule accomplishment. Where contractor fees are at risk, program management metrics are based on the final milestones of *Substantial Completion* and *Certificates of Occupancy*. Persistently poor customer satisfaction mandates a review of the alignment of PM/CM skills, experience and interests with the job assignment, role, and client. If necessary, a PM is normally redirected to another role, project, or client after thorough

discussion with the PM and negotiation with the client. Rotational assignments are considered too disruptive and are not utilized.

The companies interviewed advised that they tended also to not use tenure agreements. The owner-developer PM/CM sector specifically replied in the negative, mentioning that clients require *retention and continuity* of PMs to avoid project disruption and increased risks. New hires are always asked about their near-term career plans, and those who appear likely to be short-term employees are not hired.

Is mentoring considered a formal program management development process?

The IDA team asked if mentoring was considered a formal process, how mentors are selected, how mentees are paired with mentors, and if there is a process for mentors to report/nominate future PMs. In general, the team found that mentorship programs for future and/or current PMs in the commercial sector appear to be informal rather than structured.

In the automotive T&E sector, an answer was not provided. However, it was noted that the Marine Corps provides mentoring for acquisition programs.

In software development, informal mentoring occurs as part of the software development culture. High-level managers are expected to mentor their direct reports, such as through bi-weekly manager meetings.

In the hospitality industry, internal and external coaches are provided for director levels. Coaching helps determine next steps in development.

In the owner-developer PM/CM sector, senior PMs mentor PMs and APMs. A Senior PM's role as a mentor is based on their long-term track record, overall project portfolio, and business and customer relations acumen. Senior PMs conduct annual performance reviews and can recommend and approve which staff will be promoted from APM to PM positions when opportunities arise.

What benefits are used to incentivize and retain PM candidates?

The IDA team explored with the interviewees the topic of what types of benefits were typically offered to incentivize and retain PM candidates. These included, but were not limited to, student loan repayment, tuition and training opportunities, and retention bonuses. More specifically, the team inquired as to how the company promoted good performance and retained top talent.

In the automotive T&E sector, bonuses are provided when programs go well.

In the software development industry, all professionals receive standard benefits only.

In the hospitality industry, presidential bonuses are used to support retention. They are based on qualitative and quantitative results and their use is consistent across regions. There is also an Applause point system, with social and non-financial rewards for managers

and directors that serves to incentivize good performance. In one case, a financial director was hired from outside the company and promoted up. Annual talent reviews are conducted. Retention at senior levels is not deemed that much of a concern or a problem. Good performance is also rewarded by Presidential Awards.

In the owner-developer PM/CM sector, reimbursement for certification training can be requested. Mandatory job requirement training is company paid. Individual bonuses only occur at the executive level, but team bonuses at specific clients exist from time to time. During strong years, corporate-wide bonuses can be distributed annually by the President/CEO. Good performance is incentivized by a reduction in oversight and rewarded by the assignment of larger, more visible projects that enhance the PM's portfolio. When the client compensation range allows, salary increases are provided to top performers and promotion to executive level when business development occurs.

What are the roles of geographic limitations, assignment completion, and follow-on assignments?

The IDA team asked if there are any concerns or practices the company follows to transfer candidate PMs or exiting PMs to different geographical locations (e.g., mobility agreements), and also how it manages those in lead PM positions after PM assignments are completed.

In the automotive T&E sector, no answers were provided on geographic limitations and assignment completion. Typical follow-on assignments involve more complex projects and programs. Some PMs are hired young (e.g., in their 30s), and then developed for more senior assignments.

In the software development industry, all PM work is local, so relocation issues are not applicable. As PM assignments are long-term and ongoing, the issue of completed assignments is also deemed inapplicable.

With regard to the hospitality industry, instead of relocating to different geographical locations, this company hires from other companies. For example, a recent major hotel divestiture provided a ready-made talent pool to draw from and a retired general manager was brought on. With respect to assignment completion, a Program Management Office was formed four years ago to improve program management cohesion, integration, and financial economies of scale. The PMO now stands up new business and handles change management.

In the owner-developer PM/CM sector, younger, mobile personnel are transferred to other areas of the country to fill needs on a case-by-case basis. Hiring is done primarily on a local basis as much as possible. Long daily commutes in some regions are unavoidable at times, as project durations last only 2–3 years and managers cannot change housing locations. To handle project completion and any delays in transition to new projects, PMs

will often support business development to help generate new contracts/clients. Lead PMs are assigned to future projects where they can oversee the full scope from start to finish. Projects are assigned based on experience and interests of the PM.

PM Turnover

The IDA team asked if the company had any issues with or planned for PM turnover during a major project/program.

The automotive T&E sector witnessed higher turnover rates. Turnover appears to be planned in order to develop well-rounded managers, but rotating PMs too fast is having a negative impact on programs. This occurs with both civilian and military PMs in the government.

In the owner-developer PM/CM industry, turnover is a serious problem and care is taken to avoid it, since replacements can be hard to find. Turnover is disruptive, with information and knowledge management transfers never seamless.

Industry Rotation Programs

Each company was asked if it participated in an industry rotation program for PMs. The answer was uniformly, no. The automotive T&E sector noted, however, that government PMs do seem to move in and out of industry PM roles. The software development and hospitality sectors observed that Human Resources does benchmark industry best practices for overall management disciplines and training.[4] The owner-developer PM/CM sector advised that PM staff often migrate from general contractor PM to owner/developer PM roles and then back. An innovative rotational program could be set up between different sectors, such as the military (NAVFAC or Army Corps), supporting industries, utilities, and other institutions (schools, hospitals, stadiums, and museums). In general, a full project cycle (a two-year maximum) is necessary for a candidate to spend on a rotation in order to come away with a meaningful, career-broadening experience.

[4] For hospitality, benchmarking of companies like Marriott, Hilton, and other major companies outside of hospitality is conducted.

Illustrations

Figures

Tables

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Abbreviations

A&D	Aerospace and Defense
AABC	Army Acquisition Basic Course
AAE	Army Acquisition Executive
ACAT	Acquisition Category
AcqDemo	Defense Civilian Acquisition Workforce Demonstration Project
ACS	Advanced Civil School
AICC	Acquisition Intermediate Contracting Course
AICL	Army Intermediate Contracting Lab
AIPM	Acquisition Intermediate Program Management Course
AP	Acquisition Professional
APM	Associate Program Manager
BAH	Basic Allowance for Housing
BAS	Basic Allowance for Subsistence
BLS	Bureau of Labor Statistics
BQ	Best Qualified
CAE	Component Acquisition Executive
CAPE	Cost Assessment and Program Evaluation
CCAS	Contribution-based Compensation and Appraisal System
CCT	Contingency Contracting Team
CEO	Chief Executive Officer
CMC	Construction Management Certification
CSL	Centralized Selection List
CSRS	Civil Service Retirement System
DA	Department of the Army
DAB	Defense Acquisition Board
DACM	Director of Acquisition Career Management
DAE	Defense Acquisition Executive
DAMIR	Defense Acquisition Management Information Retrieval
DAU	Defense Acquisition University
DAWDF	Defense Acquisition Workforce Development Fund
DAWIA	Defense Acquisition Workforce Improvement Act
DBB	Defense Business Board
DoD	Department of Defense
DoDI	DoD Instruction
DOPMA	Defense Officer Personnel Management Act

DSB	Defense Science Board
FAR	Federal Acquisition Regulation
FEHBP	Federal Employees Health Benefits Program
FERS	Federal Employees Retirement System
FY	Fiscal Year
GAO	Government Accountability Office
GS	General Schedule
HQE	Highly Qualified Expert
IDA	Institute for Defense Analyses
ILE	Intermediate Level Education
IQC	Acquisition Intermediate Qualification Course
JAG	Judge Advocate General
KLP	Key Leadership Position
KO	Contracting Officer
LEED	Leadership in Energy and Environmental Design
MDAP	Major Defense Acquisition Program
MRA	Minimum Retirement Age
NCO	Non-commissioned Officer
NDAA	National Defense Authorization Act
OIPT	Overarching Integrated Product Team
OSD(A)	Office of the Secretary of Defense (Acquisition)
PCC	Pre-Command Course
PEO	Program Executive Officer
PM	Program Manager
PM/CM	Project Management/Construction Management
PMI	Project Management Institute
PMP	Project Management Professional
PPM	Professional in Project Management
ROTC	Reserve Officer Training Corps
SAE	Service Acquisition Executive
SAR	Selected Acquisition Report
SES	Senior Executive Service
SSC	Senior Service College
T&E	Test and Evaluation
TSP	Thrift Savings Plan
TWI	Training with Industry
U.S.C.	United States Code
USACE	United States Army Corps of Engineers

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14. ABSTRACT

The Institute for Defense Analyses (IDA) was asked to conduct a comprehensive study of financial and non-financial incentives for civilian and military program managers (PMs) for major defense acquisition programs in response to the requirement in Section 841(b)(1) of the National Defense Authorization Act for Fiscal Year 2018. In this study, the IDA team reviewed relevant prior research, interviewed government and industry personnel, analyzed data, and identified and assessed incentives to recruit, retain, and reward the Department of Defense PMs. This document contains the results of our research.

15. SUBJECT TERMS

Monetary and Non-monetary Incentives; DOPMA; DACM; DAWIA; ACAT I/IA; MDAP; Level III Certification; AAE; Up-or-Out Policy; Mandatory Retirement; Promotions; AcqDemo; Product Manager; Project Manager; Program Manager; Title 37; U.S. Code; DAWDF; Single Track; Dual Track; Key Leadership Positions; Acquisition Career Progression; Competitive Category; Acquisition Work Force

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