RAND

Research Report

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A Review of the Military Basic Pay Table

Analysis in Support of the Fourteenth Quadrennial Review of Military Compensation

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About This Report

In response to the establishment of the Fourteenth Quadrennial Review of Military Compensation and the mandates of Section 643 of H.R. 7900 in the National Defense Authorization Act for 2023, the RAND National Defense Research Institute was tasked with providing a comprehensive analysis of the military basic pay table, to include an assessment of the basic pay table; a comparison of the level of military pay with the pay of similar civilians; an assessment of the methodology used to annually adjust the military pay table, which is currently guided by the Employment Cost Index; and an analysis of pay for critical skill areas. This report summarizes the analysis and findings.

The research reported here was completed in June 2024 and underwent security review with the sponsor and the Defense Office of Prepublication and Security Review before public release.

RAND National Security Research Division

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For more information on the RAND Personnel, Readiness, and Health Program, see www.rand.org/nsrd/prh or contact the director (contact information is provided on the webpage).

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Summary

Rapid increases in inflation since 2020 and a strong labor market, together with reported rates of food insecurity among active duty service members of about 25 percent, have put a spotlight on military compensation and on the foundational element of the compensation system, military basic pay. Military basic pay is set out in a pay table where service members' monthly base pay is given based on their years of service (YOS) and pay grade. Section 643 of H.R. 7900 in the National Defense Authorization Act (NDAA) for 2023 mandated a study of military basic pay, as does the charter of the Quadrennial Review of Military Compensation (QRMC), a White House–directed commission that studies military compensation and takes place every four years. The Fourteenth Quadrennial Review of Military Compensation (14th QRMC) requested that the RAND National Defense Research Institute provide research support for its study of military basic pay. This report summarizes the analysis and findings of the RAND study. Specifically, our study

1. compares military pay, measured by regular military compensation (RMC), with civilian earnings and evaluates the 70th percentile benchmark developed by the Ninth Quadrennial Review of Military Compensation (9th QRMC) in 2002[1]
2. assesses the basic pay tables of junior enlisted personnel, midcareer and senior enlisted personnel, and commissioned officers
3. evaluates the Employment Cost Index (ECI) as a guide to the annual pay raise, as well as alternatives
4. assesses pay for service members in critical specialties and whether and how basic pay could be used to address personnel needs in these specialties.

In addition, for contextual background, we provide a review of the recent trends in the civilian labor market that might affect recruiting and retention outcomes and the adequacy of military basic pay and RMC. Our approach involved developing proposals for change for each of the four topic areas drawing from past studies and commissions that have assessed military compensation. It also drew from discussions with subject-matter experts (SMEs) in each service branch and in the Office of the Secretary of Defense, as well as the relevant academic literature. In addition, we analyzed relevant data, including both Defense Manpower Data Center (DMDC) pay and personnel data and civilian labor market data. We then assessed these proposals using existing models and available data, as relevant to each topic.

Findings

Comparison of Military and Civilian Pay and the 70th Percentile Benchmark

Similar to past QRMCs, we compared RMC (as defined in footnote 1) for enlisted members and for officers (as defined in footnote 1) with the pay of civilians with similar education and age and computed the weighted average of the percentile of civilian earnings, averaged across all enlisted members and all officers. We find

[1] RMC is considered the military counterpart to civilian earnings and includes basic pay, the basic allowance for housing, the basic allowance for subsistence, and the tax advantage of receiving these allowances tax free. The 70th percentile benchmark established by the 9th QRMC means that if average RMC were compared with the earnings of 100 civilians with similar characteristics as service members, average RMC would exceed the pay of 69 of those civilians, meaning that average military pay would exceed average (the 50th percentile of) civilian pay. As explained by the 9th QRMC (and discussed further in Chapter 2), average military pay exceeds average civilian pay to recruit and retain sufficient quality and quantity of personnel in recognition of the unique demands and arduous nature of military service compared with civilian employment.

that in 2021 enlisted RMC was at the 83rd percentile of comparable civilian pay for members with between zero and 20 YOS and was also at the 83rd percentile for those with between zero and 30 YOS. These figures are virtually identical to the estimates for the Thirteenth Quadrennial Review of Military Compensation (13th QRMC) computed using 2017 data, which were 84.6 percent and 84.1 percent, respectively. We estimate the weighted average RMC for officers were 76 percent and 76 percent, for the less than or equal to 20 and 30 YOS, respectively, which, like their enlisted counterparts, are the same as their 2017 values of 76 percent and 76 percent, respectively.

Section 643 of H.R. 7900 in the 2023 NDAA also requested an assessment of whether the 70th percentile benchmark should be changed. As shown in Figure S.1, for enlisted members the weighted average of RMC between zero and 20 YOS has exceeded the 70th percentile benchmark since the early 2000s, when the 70th percentile was established, owing to the faster than ECI pay raises that occurred in 2001–2010.[2] Given that the de facto RMC percentile has exceeded the benchmark for quite some time, we considered the question of whether a higher percentile is required to achieve the recruiting and retention outcomes desired by the armed services and specifically to achieve the outcomes achieved when the 70th percentile was established based on data from the 1990s. To address this question, we compared recruiting and retention outcomes in recent years relative to the period when the 70th percentile was established, as well as changes in recruiting and retention resources, such as bonuses, and changes in the conditions of service that could explain why recruiting and retention outcomes differ.

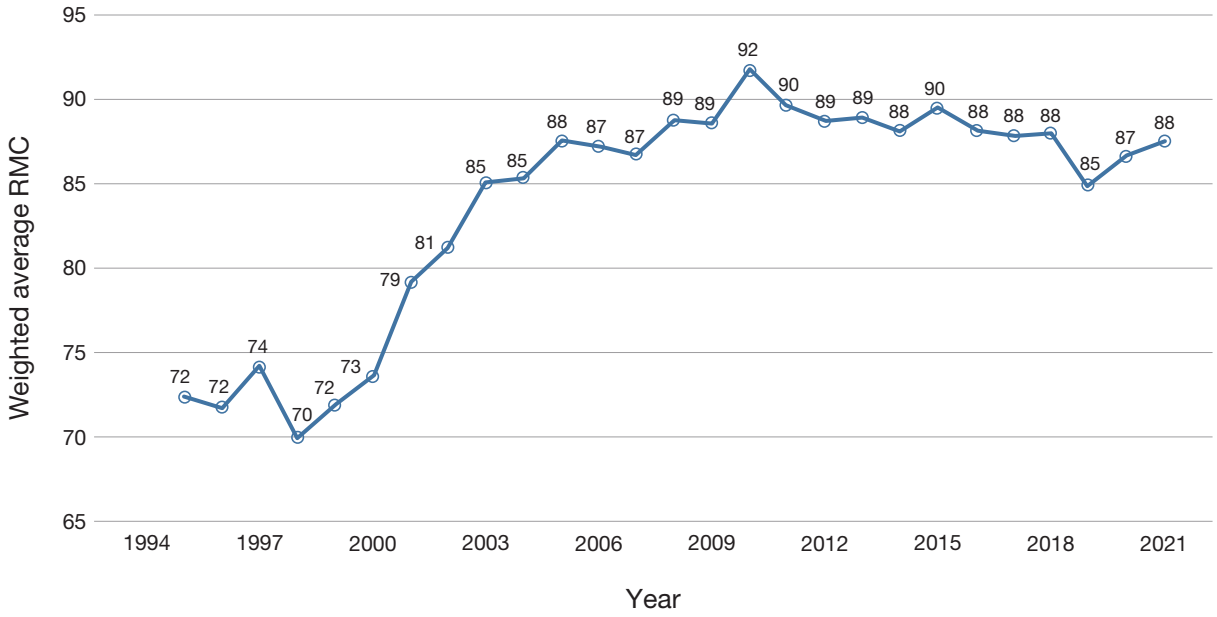
Overall, the services have met or exceeded retention and recruit quality outcomes in recent years relative to the earlier years when the 70th percentile was established. Recently, the services have experienced challenges in achieving their recruiting missions, but they have been taking aggressive steps to address these issues with expansion of recruiting resources such as bonuses, recruiters, marketing, and advertising. Furthermore, research shows that in the absence of retention problems, raising pay is the least cost-effective means of addressing recruiting shortfalls relative to these other policies. It is possible that the sustainment of recruit quality and improved retention reflect not just military pay that exceeds the 70th percentile in recent years but factors that have made recruiting and retention easier relative to the periods in the late 1980s and 1990s when the 70th percentile was established. End-strength targets have decreased significantly, owing to the post–Cold War drawdown leading to reduced accession and retention objectives. Recruiting and retention resources have increased—notably, the number of recruiters and bonuses. On the other hand, many key factors have become more challenging, such as the share of young people eligible for enlistment and the strong economy. Further, the percentage of active duty members who say they are satisfied with the military way of life has drifted downward over time, as has the share of active duty spouses who say they are in favor of their spouse staying in the military.

These challenges suggest that an RMC benchmark above the 70th percentile may be appropriate. We do not have a specific new number to offer, but we believe a figure of around the 75th to 80th percentiles for enlisted personnel and around the 75th percentile for officers may be in the right ballpark. That said, ultimately the adequacy of the military pay levels should be judged based on the services' ability to attract and retain the quantity and quality of personnel they need. If higher benchmarks for enlisted members and officers are established, future QRMCs should be required to periodically revisit any new benchmark to ensure it remains relevant as an early warning system of potential issues with the level of military pay relative to civilian pay.

[2] To enable computations of the RMC percentiles back to the 1990s, we used different and arguably less accurate input data than the data for computing the weighted average RMC percentile for 2021. Consequently, in 2021, the weighted average differs slightly from the figure shown in Figure S.1 for 2021.

FIGURE S.1

Enlisted Regular Military Compensation as a Percentile of Civilian Wages Weighted by Level of Education and Year of Service, with Education Estimated from the Active Duty Master File, 1994–2021



SOURCE: Authors' calculations using the Current Population Survey's March Annual Social and Economic Supplement, the DMDC's active duty pay files; the Greenbook; and *Population Representation in the Military Services*.

NOTE: These weighted average RMC percentiles (or summary percentiles) follow the same methodology used in Table 3.3 but use the DMDC education data instead of Status of Forces Survey of Active Duty Members (SOFS-A) data, as this allows us to make comparisons annually and back to 1994.

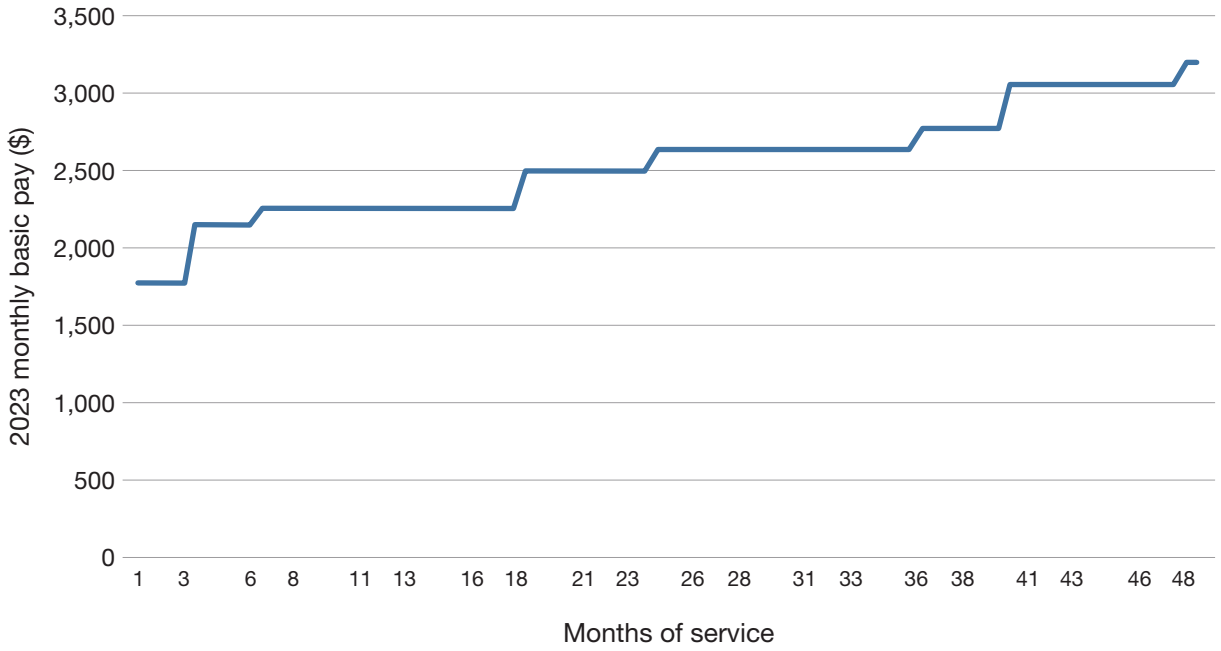
Junior Enlisted Basic Pay

Rapid inflation since 2020, together with higher rates of food insecurity among junior enlisted members, has raised concerns about the level of junior enlisted pay. It is important to recognize that because of rapid promotion in the first year of service, enlisted pay in that first year exceeds the pay of an E-1.[3] Furthermore, as shown in Figure S.2, basic pay grows substantially over the first enlistment term because of promotions and longevity increases, as well as annual pay raises, and RMC for junior enlisted members exceeds the federal poverty line even for large families. We also find that average RMC among junior enlisted members exceeds the 90th percentile of the civilian earnings of similar civilians in 2021.

Nonetheless, in the spring of 2023 the U.S. Congress put forward two proposals to increase junior enlisted basic pay, and in the winter of 2024 the House of Representatives' Quality of Life Panel argued for a junior enlisted basic pay increase as well. We assessed the two congressional proposals together with four additional proposals in terms of their expected effects on pay levels, pay compression of the basic pay table, high-quality enlistments, retention, personnel cost, and efficiency. The third proposal would increase basic pay for junior enlisted members by 12 percent, a figure that reflects the real change in civilian earnings of high school graduates and those with some college compared with the change in

[3] Basic pay may be higher than that of an E-1 at entry because some recruits enter the military above the grade of E-1 if they have more education and certain civilian acquired skills.

FIGURE S.2
Monthly Basic Pay over an Early Enlisted Career



NOTE: The figure shows basic pay from the 2023 pay table based on average U.S. Department of Defense (DoD) promotion times between 2013 and 2018.

basic pay. The fourth proposal (4a and 4b) would increase basic pay for junior enlisted by 7 percent and by 15 percent, respectively, to provide stronger recruitment incentives. The fifth proposal would increase and restructure junior enlisted pay to reflect the structure of basic pay at the beginning of the All-Volunteer Force (AVF) in 1973, and the sixth proposal would raise E-1 basic pay for those with fewer than four months of service—that is, for service members who are in boot camp—to the E-1 level for those with more than four months.

We find that none of the proposals is uniformly better in terms of its effects on the factors we considered, as is illustrated in Table S.1. The proposals with the largest pay increases had the largest effects on recruiting and retention (Proposals 2, 3, and 4b), but also were the most costly. The two congressional proposals compressed the pay table the most relative to the pay of midcareer and senior enlisted personnel and were among the least efficient. The least costly proposal we considered had a small effect on recruiting and retention and was also the least efficient proposal we considered. Thus, the proposal that dominates depends on the problem that DoD is trying to solve.

One problem of concern is food insecurity. We did not assess how the proposals would affect the extent of food insecurity among junior enlisted members and, separately, the QRMC is conducting analysis related to food insecurity, but in preliminary tabulations for this study, we did not find a statistically significant relationship between average military cash compensation and likelihood of being food insecure among junior enlisted personnel, though we do not hold constant other factors that could be important.

Similarly, as noted earlier, if DoD is seeking to improve recruiting outcomes, research shows that raising basic pay is the least cost-effective means of doing so relative to policies specifically directed at recruiting. Raising pay is inefficient because it is a permanent policy that affects pay in future years and affects other personnel costs including retirement accrual costs.

TABLE S.1

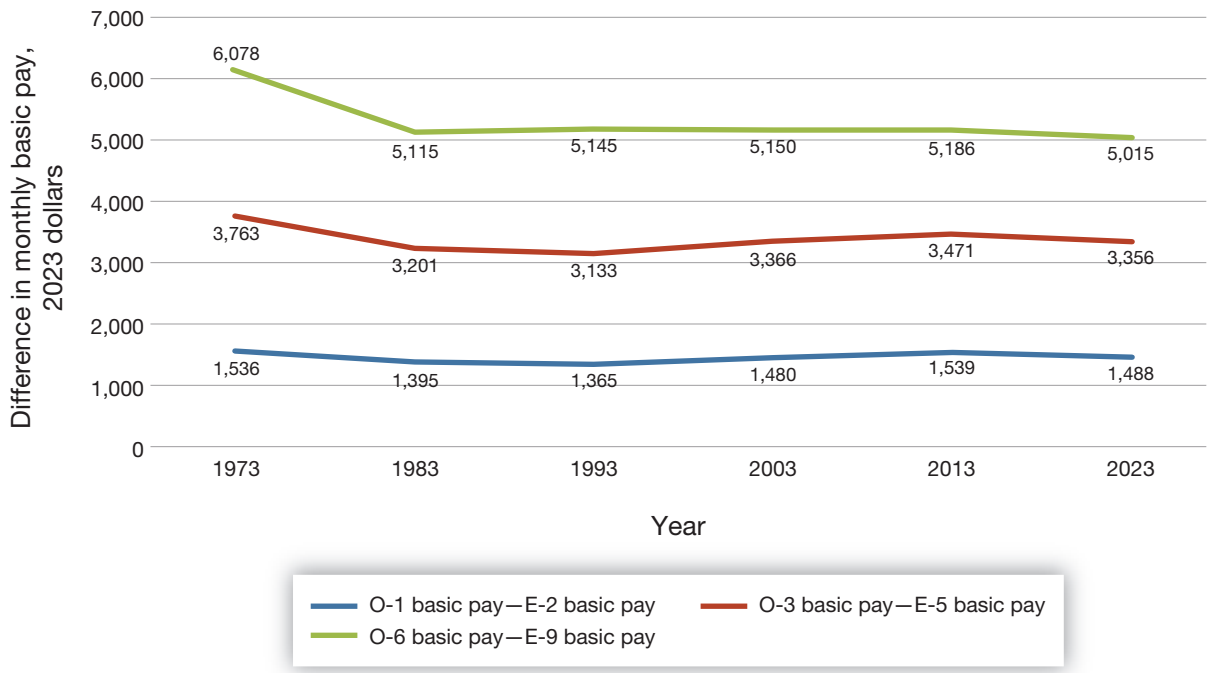
Summary of Junior Basic Pay Findings

Proposal	Recruiting	Retention	Compression	Cost	Food Security
1. Representative Garcia	▲	▲	⬢	▲	✖
2. House Armed Services Committee proposal	●	●	⬢	⬢	✖
3. Junior civilian pay catch-up proposal	●	●	●	⬢	✖
4a. Recruiting catch-up proposal (7%)	▲	▲	●	▲	✖
4b. Recruiting catch-up proposal (15%)	●	●	●	⬢	✖
5. All-volunteer force catch-up proposal	▲	▲	▲	▲	✖
6. Boot camp pay catch-up proposal	▲	▲	●	●	✖

KEY: ● = favorable ▲ = acceptable ⬢ = undesirable ✖ = not applicable.

FIGURE S.3

Dollar Difference Between Officer and Enlisted Monthly Basic Pay over Time, in Constant 2023 Dollars



SOURCE: Authors' calculations using 1973–2023 basic pay tables.

NOTE: The figure shows O-1 and E-2 basic pay for those with fewer than two YOS, O-3 and E-5 basic pay for those with over six YOS, and O-6 and E-9 basic pay for those with over 24 YOS.

Midcareer and Senior Enlisted Basic Pay

While enlisted retention has been strong overall, and average RMC among midcareer and senior enlisted members compares well relative to civilian pay, our discussions with SMEs raised concerns about two areas. The first area related to the financial reward associated with promotion, the primary means by which better performance is financially recognized. A consistent theme we heard was that the pay is only weakly related to performance and that pay increases associated with promotion were not always adequate. Another theme we heard related to performance is that E-9s are promoted around the 20th year of service, but those who stay until 30 or 40 years have no further promotion opportunities. The second area of concern was the relationship between officer pay and enlisted basic pay and the increasing absolute gap over time between the two. A related concern was that enlisted jobs have changed over time, involving more responsibility than they did in the past, and that midcareer and senior enlisted members are paid less than officers with similar responsibilities. Some SMEs recommended capping the difference between officer pay and enlisted pay and paying personnel based on job skills and responsibilities.

We evaluated four proposals to increase performance incentives, three of which would add a new E-10 grade, and one which would only provide targeted pay raises to those in the E-6 through E-9 pay grades. The proposals would restructure the pay table in a way that is more in accord with the implications of the personnel economics literature, which finds that the optimal structure of compensation in large hierarchical organizations is one where the pay increase associated with promotion is successively larger for more senior promotions. The increase in compensation can take forms other than cash compensation, including expected retirement benefits or noncash compensation. Adding an E-10 grade to provide promotion opportunities for E-9s was a proposal that was also considered by the 9th QRMC.

We find that adding an E-10 grade is predicted to increase retention and, if coupled with a targeted pay raise for E-6s through E-9s, increases the average ability of the force by increasing the retention and promotion incentives of higher-ability personnel. However, personnel costs also increase, though the proposals that include a targeted pay raise are the most efficient compared with only adding the E-10 grade without a targeted pay raise. While adding an E-10 grade is predicted to increase performance incentives, doing so could involve considerable implementation costs because new manpower requirements would need to be defined and validated and new promotion criteria would need to be defined.

We find that the absolute differences between officer and enlisted pay have grown over time, but only in nominal terms. In real 2023 dollars, these differences have declined or stayed about the same depending on the grades considered (see Figure S.3). Further, the percentage differences have declined over time. Our review of the available literature suggests that capping the differences between officer and enlisted pay could result in reduced military performance and readiness given the evidence from the civilian sector.

Our review of the comparable worth literature indicates that linking enlisted pay to officer pay based on job content and levels of responsibility would require an extensive job evaluation system that has proven difficult to create in the civilian setting. Setting pay based on factors other than supply and demand conditions, career management, and other principles of military compensation could result in an ineffective and inefficient military compensation system that could hurt readiness of the force.

Commissioned Officer Basic Pay

Officer retention has historically been strong in recent years, and average RMC among officers compares well relative to civilian pay based on our updated analysis of the RMC benchmark for 2021, as discussed above. Still, some of the discussions we held with SMEs raised two concerns regarding commissioned officer basic pay. Like concerns about midcareer and senior enlisted pay, we heard concerns about the adequacy of per-

formance incentives in the officer pay table, especially for midcareer officers and very senior officers. There were also concerns about the lower pay for lateral entrants relative to officers in the same grade who entered as an O-1, thereby making lateral entry relatively less attractive as a career alternative.

We evaluated three proposals to increase performance incentives that targeted basic pay raises to midcareer officer grades, with one proposal also raising basic pay for very senior officers by lifting the basic pay cap to the Executive Schedule I level. Since 2007, military basic pay has been capped at the Executive Schedule II level. We find that the three proposals would increase performance incentives in the midcareer and senior officer grades and would improve retention, with a modest increase in cost.

We have found that a time-in-grade pay table could increase the attractiveness of lateral entry by raising entry pay for lateral entrants relative to their pay under the current time-in-service pay table. However, we also have found that if the definition of *constructive credit* were expanded to include YOS and not just grade, as it currently does, it would enable the services to increase the attractiveness of lateral entry under the current time-in-service pay table and virtually replicate the pay advantages of a time-in-grade table for lateral entrants.

The Employment Cost Index and the Annual Basic Pay Adjustment

A key purpose of the annual basic pay adjustment is to ensure that growth in basic pay reflects the change in the civilian earnings opportunities faced by military personnel and potential recruits and to prevent military pay from falling behind potential earnings opportunities in the civilian labor market. For the last two decades the ECI has been used to provide formal guidance for the annual adjustment of basic pay. The ECI is a nationally representative measure of the changes in employer costs of private-sector wage and salary workers computed quarterly by the U.S. Bureau of Labor Statistics (BLS). The ECI that is used to inform the annual January basic pay raise is the third quarter (Q3) ECI, computed 15 months prior to the January pay raise. Thus, the January 2025 pay raise is informed by the change in the Q3 2023 ECI (which was released in October 2023) relative to Q3 2022 (October 2022). The recent, rapid uptick in inflation has contributed to a renewed interest in whether the ECI continues to be the best source of guidance for making these adjustments in a timely and accurate fashion. Of particular concern is the 15-month time lag and the backward-looking computation of the change in ECI, which during times of inflation means that the January pay raise will miss potential pay growth due to inflation during the time lag. Another concern, raised in the 1990s, is that the ECI reflects pay growth in the entire private-sector workforce, which is older on average and has a different gender and education distribution that the active duty military workforce. Thus, the ECI does not accurately reflect the growth in pay that is potentially most relevant to military personnel.

We evaluated the ECI, as well as several alternatives, in terms of accuracy, timeliness, cost-effectiveness, and credibility. Table S.2 summarizes the findings.

The ECI captures broad changes in the civilian labor market in general, and to the extent that service members make retention decisions based on the civilian labor market in general, the ECI would capture these civilian earnings. The ECI is highly credible, since it is computed by the BLS, and is cost-effective to the extent that DoD does not incur the cost of computing it. On the other hand, the 15-month lag hurts the timeliness of the ECI, which affects service members during times of inflation.

We also considered a variant of the traditional Q3 ECI that would involve using an ECI from a more recent quarter relative to the January pay raise, such as the second (June) or third (October) quarter ECI prior to the pay raise. Thus, rather than rely on the October 2023 ECI, the January 2025 pay raise would rely on the June 2024 ECI or perhaps the October 2024 ECI, thereby reducing the time lag from 15 months to six months or less. To facilitate budget deliberations, this variant would use the traditional ECI for budgeting purposes. This alternative would improve the timeliness of the pay adjustment guidance and have the other

TABLE S.2
Summary of Assessment of the ECI and Alternatives

Index	ECI		Forecast of the ECI	DECI	Consumer Price Index for All Urban Consumers (CPI-U)
	Traditional	Variant: Separate Budget and Pay Raise ECI			
Accuracy	Accurately measures employer costs for entire labor force, not serving members	Same accuracy as the ECI	Less accurate than the ECI	More accurate than the ECI and captures rapid changes in labor market	Significantly less accurate than the ECI or any measure of earnings changes
Timeliness	15-month lag	More timely	More timely	Same as the ECI	Same as the ECI
Cost-effectiveness	Existing measure	Method introduces budgeting errors	Existing measure, but ad hoc	Would need to be computed by DoD or an external group	Existing measure
Credibility	High credibility attributed to the BLS, widely used	Better messaging to service members because more timely	Unclear if and how used	Needs to be computed by an independent group	High credibility attributed to the BLS, widely used
Other considerations	Less accurate measure of external market earnings of serving members	Reflects more current inflation impacts	Less accurate pay adjustment	Represents military skill competitiveness, historically more volatile	Smaller basic pay increases than the ECI during periods of increased labor productivity

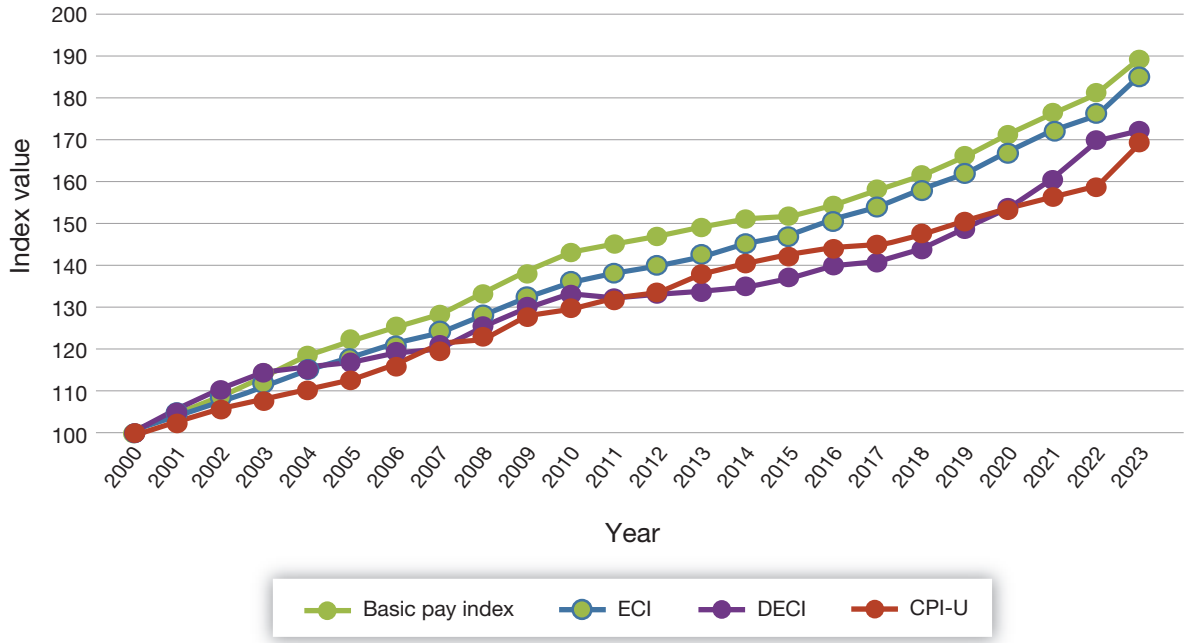
advantages and disadvantages of the ECI. However, it would also mean that the ECI used for the pay raise would be out of sync with the budget process, and if the ECI used for budgeting differed from the ECI used for the pay raise, DoD will find it has either a budgeting shortfall or an overage. We estimated that the size of these shortfalls or overages were relatively small until 2022. When inflation increased, we found DoD would have faced significant shortfalls of approximately $340 million in 2022 and about $480 million in 2023.

We also considered a forecast of the ECI produced by the Congressional Budget Office (CBO) that would have the advantage of being forward-looking and more timely. We found that the forecast was less accurate than the traditionally used Q3 ECI, and because it was unclear how it was computed and is only computed on an ad hoc basic currently, we found it less credible and cost-effective than the current ECI.

Congress specifically requested consideration of the Defense Employment Cost Index (DECI) as an alternative. The DECI is an index developed in the 1990s by RAND and evaluated at the request of the 13th QRMC as a supplemental study not included in the 13th QRMC's final report. The advantages of the DECI are that it takes the perspective civilian employees, rather than employers, and focuses on the labor market opportunities of civilians with similar characteristics as military personnel, thereby more accurately reflecting the external market as service members make retention decisions. The disadvantages of the DECI are that it is subject to more volatility than the ECI during times of significant churn or turnover in the labor market, and it would have to be computed by DoD or some external entity, thereby resulting in a cost to DoD and potentially calling its credibility into question by some stakeholders. Further, it would also be subject to a 15-month timeliness lag.

We also considered the CPI-U, a metric on inflation, as a potential alternative to the ECI given concerns about recent inflation. We found that changes in the CPI-U miss changes in civilian wages due to increases in worker productivity. Since 2000, CPI-U has grown slower than the ECI, implying that military personnel would have missed out on significant pay raises and potentially the services might have experienced significant recruiting and retention challenges (see Figure S.4).

FIGURE S.4
Index of Growth in Basic Pay, ECI, DECI, and CPI-U, Relative to 2000



Pay for Critical Skills

We considered three policy questions raised by Section 643 of H.R. 7900 in the fiscal year (FY) 2023 NDAA:

1. Does the need for higher pay in critical skills occur broadly across the force?
2. Does the current system of supplementing basic pay with bonuses and special pays adequately address the need for wage differentials for these specialties?
3. Should the pay table be modified to provide wage differentials for critical specialties?

To help answer these policy questions, we took a data-driven approach informed by discussions with SMEs and a literature review to consider three related research questions:

1. What is the prevalence of critical specialties, and how much is cash compensation higher owing to receipt of special and incentive (S&I) pays?
2. Does the evidence indicate that the current S&I pay system is adequate for providing wage differentials?
3. What might a pay table approach to offering wage differentials for critical skills look like, and what are the advantages and disadvantages of a pay table approach?

We found that S&I pays are highly targeted, with only a small share of occupations showing a high incidence of S&I pays, and with only a few occupations receiving large amounts of such pays. We found that cash compensation is uniformly higher in critical skills. Previous research shows that S&I pays are effective as accession and retention incentives, and cost-effective, but research has gaps in some key areas, such as whether some S&I pays are set too high or too broadly, resulting in the services paying economic rents (that is, paying members more than is required). Furthermore, the SMEs we interviewed generally favored the current S&I pay approach to setting wage differentials. Finally, we found that consolidating into the pay table S&I pays that currently require a service obligation would be inefficient.

Table S.3 summarizes the findings with respect to the policy questions.

TABLE S.3
Summary of Policy Implications of Analysis of Pay for Critical Skills

Policy Questions	Findings and Implications from the Analysis
1. Does the need for higher pay in critical skills occur broadly across the force?	No. S&I pays are highly targeted, and relatively few occupations receive large amounts in S&I pays.
2. Does the current system of supplementing basic pay with bonuses and special pays adequately address need for wage differentials in these specialties?	Yes. SMEs generally favored the current S&I pay approach for setting wage differentials, and research shows that these pays improve readiness and are cost-effective. Even so, the SMEs and the literature review identified areas where S&I pays might be improved, though more analysis is needed for specific recommendations.
3. Should the pay table be modified to provide wage differentials for critical specialties?	Not at this time. While some S&I pays might be consolidated into a wage differential, pays that depend on a service obligation are more efficient that those that are not, and these pays should not be consolidated into a wage differential.

SOURCE: Authors' analysis of the existing literature and interviews with SMEs.

Wrap-up

A periodic review of the military pay table is important to ensure the continued success of the AVF and the ability of the services to attract and retain the quality and quantity of personnel they need. Our review focused on issues raised in the charter of the 14th QRMC, in Section 643 of H.R. 7900 of the NDAA for FY 2023, and in SME discussions. With respect to junior enlisted basic pay, none of the proposals emerged as uniformly better in terms of effects on recruiting, retention, cost, efficiency, and pay compression, raising the question of ultimately what problems are being specifically addressed and whether other, more targeted and tailored, policies would be more effective and efficient. For example, pay is a blunt and costly instrument for addressing recruiting challenges that can be more effectively and efficiently addressed by the types of policies the services have recently been pursuing, such as increasing the number of recruiters, marketing, and advertising.

With respect to career enlisted personnel and commissioned officers, SMEs raised concerns about the weak link between pay increases and performance in the pay table. We considered proposals that would restructure the pay table for each group to provide successively larger pay bumps associated with promotion, including adding a new E-10 grade, and find that these proposals would improve retention and performance incentives but would also modestly increase personnel costs. Adding an E-10 grade could involve significant implementation costs that we did not estimate in our analysis. We find linking enlisted pay with officer pay, whether to address pay inequality or to better reflect similar job content among enlisted and officer jobs, would move the setting of military pay away from the market-based principles that have guided the setting of military pay successfully over the course of the AVF and could result in recruiting and retention problems.

Rising inflation has put the spotlight on the annual pay adjustment currently guided by the ECI. Overall, we find that the ECI has functioned well as a guide to the pay adjustment, though using a more recent ECI would help address the concerns about the time lag. The DECI has the advantage of providing information about the labor market opportunities specific to people who have characteristics similar to those in the military and could be used as a supplement to the ECI, especially when DoD and Congress are considering deviating from the ECI guidance.

Finally, we find that the services use S&I pays to create pay differentials, whether as recruiting or retention incentives, to recognize unusual or hazardous duties, or as persistent better external market opportunities. While some S&I pays might be better consolidated, it is important that any such consolidation does not adversely affect the efficiency or effectiveness of these pays.

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CHAPTER 1

Introduction

On January 31, 2023, the President established the Fourteenth Quadrennial Review of Military Compensation (14th QRMC) with a charter to address five issues, including

- a review of the military basic pay table to ensure that it enables the U.S. Department of Defense (DoD) to recruit and retain the personnel it requires
- an evaluation of the 70th percentile benchmark used to compare military pay with civilian pay and an assessment of whether the benchmark should be changed[1]
- a review of the compensation system as it pertains to service members in critical skills to ensure that the services can meet compensation requirements for personnel in these skills.

In addition, Section 643 of H.R. 7900 in the National Defense Authorization Act (NDAA) for 2023 mandated a study of military basic pay that included the three elements above, as well as specifically requested information on the model used to determine basic pay in the current basic pay tables, including

- an analysis of whether to update the current model to meet the needs of the 2023 employment market
- a historical understanding of when the current model was established and how frequently it has been updated during the last ten years
- an understanding of the assumptions on which the model is based and how such assumptions are validated
- an analysis of time-in-grade requirements and how they may affect retention and promotion
- an assessment of how recruiting and retention information is used to adjust the model.

The congressional mandate also required an assessment of whether to adjust the annual increase in basic pay currently guided by changes in the Employment Cost Index (ECI) as a measure of the growth in private-sector employment costs or use a different index, such as the Defense Employment Cost Index (DECI).

Given the overlap between the QRMC charter and the NDAA 2023 mandate, the latter requirement was rolled into the broader QRMC study of basic pay. The 14th QRMC requested that the RAND National Defense Research Institute provide research support for its study of military basic pay to meet these requirements. This report summarizes the analysis and findings of the RAND study. Specifically, our study

- compares military pay, measured by RMC, with civilian earnings and evaluates the 70th percentile benchmark developed by the 9th QRMC in 2002
- assesses the basic pay tables of junior enlisted personnel, midcareer and senior enlisted personnel, and commissioned officers

[1] As we discuss in greater detail in Chapter 3, the 70th percentile refers to how regular military compensation (RMC) compares with the pay of civilians of similar education, age, and gender; in 2002 the Ninth Quadrennial Review of Military Compensation (9th QRMC) established the 70th percentile as the benchmark for this comparison, meaning that average RMC would exceed the pay of 70 percent of comparable civilians.

- evaluates the ECI as a guide to the annual pay raise, as well as alternatives to the ECI
- assesses pay for service members in critical specialties and whether and how basic pay could be used to address personnel needs in these specialties.

In addition, for contextual background we provide a review of the recent trends in the civilian labor market that might affect recruiting and retention outcomes and the adequacy of military basic pay and RMC.

Our approach involved developing proposals for change for each of the four topic areas of our study, drawing from past studies and commissions that have assessed military compensation. It also draws from discussions with subject-matter experts (SMEs) in each service branch and in the Office of the Secretary of Defense (OSD), as well as from the relevant academic literature. In addition, we analyzed relevant data, including both Defense Manpower Data Center (DMDC) pay and personnel data and civilian labor market data. We then assessed these proposals using existing models and available data, as relevant to each topic.

Our analysis builds especially on the work of two prior QRMCs that assessed the military basic pay table—the Seventh Quadrennial Review of Military Compensation (7th QRMC) in 1992 and the 9th QRMC in 2002 (DoD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992a and 1992b; DoD, OUSD[P&R], 2002)—though other QRMCs, commissions, and studies have considered the basic pay table. The 7th QRMC focused on whether the basic pay table and the mechanism for adjusting basic pay were appropriate for the post–Cold War era, while the 9th QRMC considered whether the level of RMC and the structure of the basic table were adequate given the changes in the external civilian labor market due to the dot-com boom of the late 1990s and the changing educational composition of the military. As the 7th QRMC report stated,

> Basic pay is the principal vehicle for linking compensation to military performance measure by rank. However, ad hoc changes over the last forty years have distorted this linkage so that years of service weigh more heavily than promotion as a determinant of pay. (DoD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992a, p. 5)

The 7th QRMC found "significant inconsistencies in the pay table and proposed targeted changes that sought to "relieve pay compression between grades" and also noted that the purpose of the annual pay raise is "to adjust military pay, in light of civilian wage growth, to ensure that entering into or continuing a military career remains attractive" (DoD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992a, pp. 5, 9). It assessed the ECI, as well as the DECI, an index being developed at the time of the 7th QRMC. It recommended continued use of the ECI until development of the DECI was complete, at which time the ECI should be reevaluated. We discuss the 7th QRMC findings in more detail in Chapter 6 in our assessment of the ECI and DECI.

The 9th QRMC found that the adjustments in both the level and structure of the pay table were needed to ensure a high enough pay premium for a more educated force, especially for midgrade enlisted members and junior officers. For enlisted members, it recommended targeted basic pay increases for those in the E-5 to E-7 grades with between six and 20 years of service (YOS) to raise pay toward the 70th percentile of civilians of comparable education and age. It also recommended raising basic pay for grades E-8 and E-9 to sustain performance incentives, a modest increase for junior enlisted members, and consideration of the possible addition of an E-10 grade to provide performance incentives via promotion for E-9s. For commissioned officers, the 9th QRMC recommended basic pay increases for O-3s and O-4s. Targeted pay increases were implemented in 2000 through 2004, as well as in 2007, in addition to annual across-the-board increases. We discuss the 70th percentile benchmark further in Chapter 2 and targeted pay raises in Chapters 3–5.

We also relied on insights gained from speaking to military compensation and personnel management SMEs in the winter and spring of 2023. We sought to gain their perspectives on the issues raised in Section 643

of H.R. 7900 in the 2023 NDAA, as well as on whether they perceived that the military pay tables need to be improved and, if so, how. We also reviewed the academic literature on setting compensation in large hierarchical organizations that gave promotions primarily within the organization, as well as the literature on military recruiting and retention. In each chapter we summarize the relevant insights from the literature and from our SME discussions.

Our approach to evaluating proposals differed depending on the topic area, as summarized in Table 1.1. The approach involved simulating how proposals would affect the level and structure of the military pay over a career, using available models from peer-reviewed studies to estimate how proposals to change basic pay would affect recruiting and retention outcomes, as well as cost and performance, and using available data provided by the DMDC and the OSD, such as those on recent recruiting and retention outcomes, as appropriate. Details of the specific models, data, and literature are discussed in detail in later chapters.

TABLE 1.1
Study Topics and Analytic Approaches for Assessing Proposals

Topic Area	Types of Proposals	Analytic Approaches
1. Comparison of military and civilian pay (RMC percentiles)	Consider whether a benchmark other than the 70th percentile is warranted	Review RMC percentiles, and recruiting and retention outcomes using available data since the 70th percentile was established
2a. Junior enlisted basic pay	Targeted basic pay increases	Tabulate effects on basic pay, estimate effects on high-quality enlistments, estimate retention and cost effects
2b. Midcareer and senior enlisted basic pay	Targeted pay increases, add a grade	Tabulate effects on basic pay, estimate retention and cost effects, estimate effects on performance
2c. Commissioned officer basic pay	Targeted pay increases	Tabulate effects on basic pay, estimate retention and cost effects, estimate effects on performance
3. Annual basic pay adjustment	Alternative annual pay adjustment methods	Assess alternatives in terms of accuracy, timeliness, cost-effectiveness, and credibility
4. Pay for critical skills	Alternative approaches to implementing a basic pay differential for critical skills	Tabulate effects on pay over career, draw insights from literature on efficiency

Context for Our Study

A major motivation for the interest in revisiting the setting of the military pay table have been the rapid and dramatic increases in inflation that began in 2021 and the shifts in the labor market that occurred during and after the coronavirus disease 2019 (COVID-19) pandemic. The pandemic-related shifts in the labor market were part of a set of larger shifts that has been occurring over the past two decades, such as declining labor force participation (LFP) rates (particularly among young men) and declining hours of work. These shifts are relevant to the setting of military pay because research over the 50 years of the All-Volunteer Force (AVF) consistently finds that changes in civilian external opportunities for service members and potential recruits affect both military recruiting and retention outcomes. Appendix A provides a detailed overview of relevant civilian trends over the past two decades, including a review of the changes in inflation and of the broad changes in labor market activity and factors related to the demand for labor and supply of labor. We also

discuss how the COVID-19 pandemic changed civilian employment and discuss emerging trends, such as working from home, that may be a permanent feature of the labor market.

The Organization of This Report

Chapter 2 provides our comparison of military pay and civilian pay and considers whether the 70th percentile benchmark should be revised. In Chapters 3–5 we assess junior enlisted basic pay, midcareer and senior enlisted basic pay, and commissioned officer basic pay, respectively. Chapter 6 presents our assessment of the ECI and alternative methods of adjusting basic pay annually. In Chapter 7 we consider pay for critical specialties, and we offer a summary of our findings and conclusions in Chapter 8.

CHAPTER 2

Comparison of Military and Civilian Pay and Assessment of the 70th Percentile Benchmark

As noted in Chapter 1, Section 643 of H.R. 7900 of the fiscal year (FY) 2023 NDAA requires a study of basic pay that includes an analysis of how basic pay has compared with civilian pay since the 70th percentile was established and whether the 70th percentile benchmark is still an appropriate target for DoD to accomplish its recruiting and retention goals. This chapter summarizes the analysis related to this provision.

It is useful to begin with what is meant by the 70th percentile when discussing comparisons of military and civilian pay. When used in such comparisons, military pay is measured as RMC, which consists of basic pay, the basic allowance for housing (BAH), the basic allowance for subsistence (BAS), and the tax advantage associated with receiving these allowances tax free. The 70th percentile means that if one were to compare RMC of the average military enlisted member or officer to the earnings of 100 civilians with similar characteristics, the service member would earn more than 69 of those civilians. That is, average military pay would equal or exceed the average civilian pay at the 70th percentile. RMC is used as the metric of military pay based on the conclusions of the Office of the Assistant Secretary of Defense for Manpower's Task Force on Military Compensation (the Gorham Commission) in the 1960s, which found that RMC was the appropriate counterpart to civilian earnings (DoD, OUS[P&R], 2018a).

The 70th percentile as a benchmark for assessing the adequacy of military pay levels was instituted by the 9th QRMC, which found, "Pay at around the 70th percentile of comparably educated civilians has been necessary to enable the military to recruit and retain the quality and quantity of personnel it requires" given the unique conditions of military service (DoD, OUSD[P&R], 2002, p. xxiii). The conclusions of the 9th QRMC were based on the input of previous commissions, study groups, and QRMCs, including the 1948 Advisory Commission on Service Pay (the Hook Commission), which established the precedent that military pay should be compared with the pay of similar civilians (Advisory Commission on Service Pay, 1948), and the 1970 President's Commission on an All-Volunteer Armed Force (the Gates Commission), which noted that higher levels of military pay relative to civilian pay may be needed given the conditions of military and service and the need to recruit and retain volunteers (U.S. President's Commission on an All-Volunteer Armed Force, 1970). The 9th QRMC's conclusions were also based on analyses of data from the 1990s that found that pay at around the 70th percentile had historically been necessary to recruit and retain the quality and quantity of personnel required by the services (Asch, Hosek, and Warner, 2001; Hosek and Sharp, 2001). The recommendations of the 9th QRMC and subsequent QRMCs were also based on a history of research over the AVF years that consistently found that recruiting and retention outcomes were positively related to changes in military pay.[1]

Since the 9th QRMC, each QRMC has compared military and civilian pay and found that average RMC has been at or above the 70th percentile benchmark. The Thirteenth Quadrennial Review of Military

[1] An overview of these studies can be found in Asch, Hosek, and Warner, 2007; Asch and Warner, 2018; Warner, 2012; and Warner and Asch, 1995. Table C.11 summarizes estimates of the relationship between military recruiting and military pay relative to civilian pay.

Compensation (13th QRMC) was the last QRMC to compare military and civilian pay; it found that RMC was more than adequate relative to civilian pay, not only because average RMC exceed the 70th percentile but also because the services were meeting their recruiting and retention objectives overall.

Much has changed since the 2020 report of the 13th QRMC, however. As discussed in Chapter 1 (and Appendix A), the civilian labor market from which the services recruit and retain personnel has changed markedly, amplified by changes due to the COVID-19 pandemic, and inflation has spiked since 2020, reducing the purchasing power of both military pay and civilian pay. Furthermore, the services, and especially the Army, have struggled to meet their recruiting objectives; the Army missed its recruiting objectives in 2022 and 2023, while the Department of the Air Force and the Navy missed their active duty enlisted recruiting objectives in 2023. Across the services, however, overall retention has been strong.

These changes raise the question of how military pay compares with civilian pay since the 13th QRMC analysis. A second question, relevant to the requirement of Section 643 of H.R. 7900 of the FY 2023 NDAA that motivates this analysis, is whether these changes suggest that the 70th percentile benchmark should be changed and, if so, what the new benchmark should be. Our analysis in this chapter seeks to address both questions.

To address the first question, we describe the distribution of educational attainment among military personnel, which is used to inform our comparisons of military and civilian pay. We then list the sources for military and civilian pay data, describe the methodology used to compare the two, and show and discuss our findings given recruiting and retention outcomes since the 13th QRMC. The second part of the chapter addresses the second question, considering how military pay has compared with civilian pay since the 70th percentile benchmark was established and examining factors that might argue for changing the 70th benchmark and those that might argue for leaving it as is.

It is important to note that, ultimately, any assessment of the adequacy of military pay should be based on whether the services are able to attract and retain adequate numbers of personnel of sufficient quality to meet their readiness needs; it should not be based on whether military pay exceeds a specific benchmark. Further, such an assessment should identify whether any recruiting and retention challenges are due to transitory factors or to factors specific to a community of military personnel that could be more cost-effectively addressed with bonuses and special and incentive (S&I) pay policies. That said, decisions about the adequacy of military pay need a starting point, and for decades, that starting point has been the 70th percentile of the earnings of civilians with characteristics similar to those of military personnel.

Updated Comparison of Regular Military Compensation and Civilian Pay

We compare military pay with that of comparable civilians following the methodology laid out in Asch et al. (2020). RMC is calculated as the sum of basic pay, BAH, BAS, and the federal tax advantage resulting from those allowance being free from taxes.[2] To ensure that our comparisons are between military personnel and "comparable" civilians, we weight our comparisons by education and, in the case of aggregate RMC percentile estimates, YOS. We first describe the distribution of military personnel's educational attainment, discuss our data sources on military and civilian pay, describe the methodology used to compare the two, and then present the results.

[2] For active duty members receiving government-furnished housing, the value of that housing is imputed as the value of BAH. Similarly, the value of government-furnished meals is imputed as the value of BAS. Insofar as service members value their government-furnished housing and/or meals as less than BAH or BAS, such as junior enlisted members living in barracks, the imputed RMC will overstate the value of compensation to these members.

Educational Attainment

For information on military personnel's self-reported educational attainment, we use the Status of Forces Survey of Active Duty members (SOFS-A), a web-based survey of the active component population. Using the individual-level data, we calculate the distribution of educational attainment of each pay grade for enlisted personnel in Table 2.1. This table gives the percentage of enlisted members with some college or Associate's degree, or with a Bachelor's degree or higher for selected years. The table shows that enlisted personnel increasingly have bachelor's or higher degrees, continuing a trend of rising educational attainment for enlisted personnel from earlier years. However, education attainment among officers has changed little between 2017 and 2020, as seen in Table 2.2, which shows the percentage of officer members with a college degree or advanced degree.

TABLE 2.1
Educational Attainment of Enlisted Personnel, by Pay Grade

	Percent with Some College or Associate's Degree				Percent with Bachelor's Degree or Higher			
Pay Grade	1999	2009	2017	2020	1999	2009	2017	2020
E-1	7	NR	NR	25	1	NR	NR	0
E-2	18	28	33	28	0	1	0	1
E-3	22	48	43	42	2	3	4	5
E-4	31	54	50	48	5	7	9	9
E-5	47	67	66	63	6	6	10	11
E-6	57	73	73	65	10	9	14	18
E-7	60	73	64	63	18	16	27	28
E-8	56	67	56	49	22	24	39	41
E-9	57	49	40	34	27	44	55	57

SOURCES: 1999–2017 education distributions come from Smith, Asch, and Mattock (2020); 2020 distributions come from SOFS-A for 2020 (DoD, OPA, 2020b).

NOTE: NR = not reported. To make the calculations, survey responses are weighted to be representative of the force using Status of Forces Survey (SOFS) observation weights (i.e., the data element *finalwgt* in the SOFS dataset).

TABLE 2.2
Educational Attainment of Officer Personnel, by Pay Grade

	Percent with College Degree				Percent with Advanced Degree			
Pay Grade	1999	2009	2017	2020	1999	2009	2017	2020
O-1	97	93	91	92	3	6	8	6
O-2	91	87	87	83	9	11	12	16
O-3	59	60	57	55	39	39	42	44
O-4	31	30	20	20	69	69	79	79
O-5	15	13	7	8	85	85	93	91
O-6	8	4	2	2	92	96	98	98

SOURCES: 1999–2017 education distributions come from Smith, Asch, and Mattock (2020); 2020 distributions come from SOFS-A for 2020 (DoD, OPA, 2020b).

NOTE: To make the calculations, survey responses are weighted to be representative of the force using SOFS observation weights (i.e., the data element ***finalwgt*** in the SOFS dataset).

The data in Tables 2.1 and 2.2 are used to create an education distribution by YOS for both enlisted and officer personnel, which is required to calculate the RMC percentile relative to civilian pay in the following section. To make this conversion, we use Table A6 from DoD's *Selected Military Compensation Tables* reports (commonly known as the Greenbooks), which contains information about personnel distribution by pay grade and YOS. We predict the education distribution by YOS using the same methodology developed by Hosek et al. (2018) and detailed in Appendix B.

Regular Military Compensation Percentiles

We compare military pay, as measured by RMC, to that of comparable civilians. We do so by computing the RMC percentile, which measures where RMC falls relative to the civilian wage distribution. In this section we describe the data and methodology used to calculate RMC percentiles and then discusses the findings.

Data Sources and Methodology

We use two different approaches to calculating the RMC percentiles, each having a specific purpose. First, to closely examine the adequacy of military pay across a career, we calculate RMC percentiles for each of the first 30 YOS for both enlisted members and officers, an approach we call detailed RMC. Second, it is also useful to estimate a single RMC percentile that provides a summary comparison of military pay with that of comparable civilians in a given year, which we call summary RMC. The summary RMC percentiles can be thought of as a weighted average of the detailed RMC percentiles, where the weights are derived from the military education distribution and the personnel counts by YOS.[3] Table 2.3 lists the data sources used in the calculations and indicates whether the data are used in either the detailed or summary RMC percentiles.

The two approaches share some data and methodologies: in both we use the March Annual Social and Economic Supplement (ASEC) from the Current Population Survey (CPS), which includes individuals' reported weekly wages, ages, and education levels. It is designed by the U.S. Bureau of Labor Statistics (BLS) to be representative of the entire U.S. population. The Greenbook provides RMC by years of experience and serves as our source for military pay data. It lists the average annual pay for each year of service, which we convert to weekly pay in the analysis. The March ASEC also lists details about respondents' ages and education levels, which we use to identify "comparable" civilians in our comparison of military and civilian pay.

TABLE 2.3
List of Data Sources for Regular Military Compensation Percentile Calculation

Data	Provides Information on . . .	Detailed RMC	Summary RMC
ASEC	Civilian pay, age, and education	Yes	Yes
Population Representation in the Military Services (PopRep)	Gender composition of the military	Yes	Yes
Greenbook	RMC by YOS	Yes	Yes
DMDC active duty pay files	Personnel counts and education by YOS	No	Yes
SOFS-A	Military education by pay grade	No	Yes

NOTE: The DMDC active duty pay files are used as a source of military education only in our analysis of military pay over time, as they are available back to 1994, allowing a longer-range comparison than SOFS data permit.

[3] For a full description of both the summary and detailed RMC percentiles methodologies, see Appendix B.

Given that military service members are full-time, full-year workers, we remove respondents from the CPS data who do not meet this criterion. Unlike service members, civilians' years of service are not directly recorded, yet this information is necessary to ensure that military personnel are being compared with the appropriate civilian cohorts. Following Smith, Asch, and Mattock (2020), we impute each respondent's years of experience based on their age and education. For high school graduates, years of experience are equal to their age minus 18. For those with associate's degrees or some college, years of experience are their age at the time of the CPS survey minus 20. For bachelor's degree holders, years of service are their age minus 22, and for those with a master's degree or higher, it is their age minus 24.

We alter the stock CPS weights to reflect the gender makeup of the force, using data from *PopRep* for 2020. As of 2020, the most recent year for which data are available, women made up 16.9 percent of the enlisted active component and 19.7 percent of the active component commissioned officer corps, shares which have risen in recent years. Thus, when we calculate RMC percentiles, the comparisons reflect not only the U.S. population but also the active components' gender distribution.

In the detailed RMC percentile calculations, we smooth the 50th and 70th percentiles of civilian pay, RMC, and the RMC percentiles using quadratic regressions. This step, which is not taken in the summary RMC percentiles, makes for a more digestible figure and fills in the missing YOS from the Greenbook.

The process for calculating summary RMC percentiles was originally developed and described in Hosek et al. (2018, pp. 26–28). It requires additional data, which are analyzed with some slight differences. In this method, as in the detailed RMC percentile calculations, RMC percentiles are also calculated for every year of service, but the data are not smoothed through regression analysis. Instead raw RMC percentiles are calculated for each year of service and each relevant education level of civilians. Next, we average each education category's RMC percentile for a given year of service weighting by the education distribution of the military, creating a weighted average RMC percentile for every year of service. We weight the raw RMC percentiles by the military education fractions to ensure that the YOS-level weighted average RMC reflects a comparison with "comparable" civilians.

For example, early career enlisted personnel often have only a high school degree, so the raw RMC percentile comparing RMC with the earnings of high-school-educated civilians has a higher weight when calculating the YOS-level weighted RMC percentile. Similarly, almost no early career enlisted members have master's degrees, so the RMC percentile comparing RMC with civilians with master's degrees carries virtually no weight. This is a crucial difference from the detailed RMC percentile, where RMC is compared only with a single, static civilian group (e.g., civilians with high school diplomas for early career enlisted members).[4] To derive a final weighted average RMC percentile, summarily comparing military and civilian pay, we average each year of service's RMC percentile, weighting each one by the number of service members in its respective year of service, where data on personnel counts come from the DMDC's active duty pay files.[5]

Regular Military Compensation Percentiles over a Career in 2021

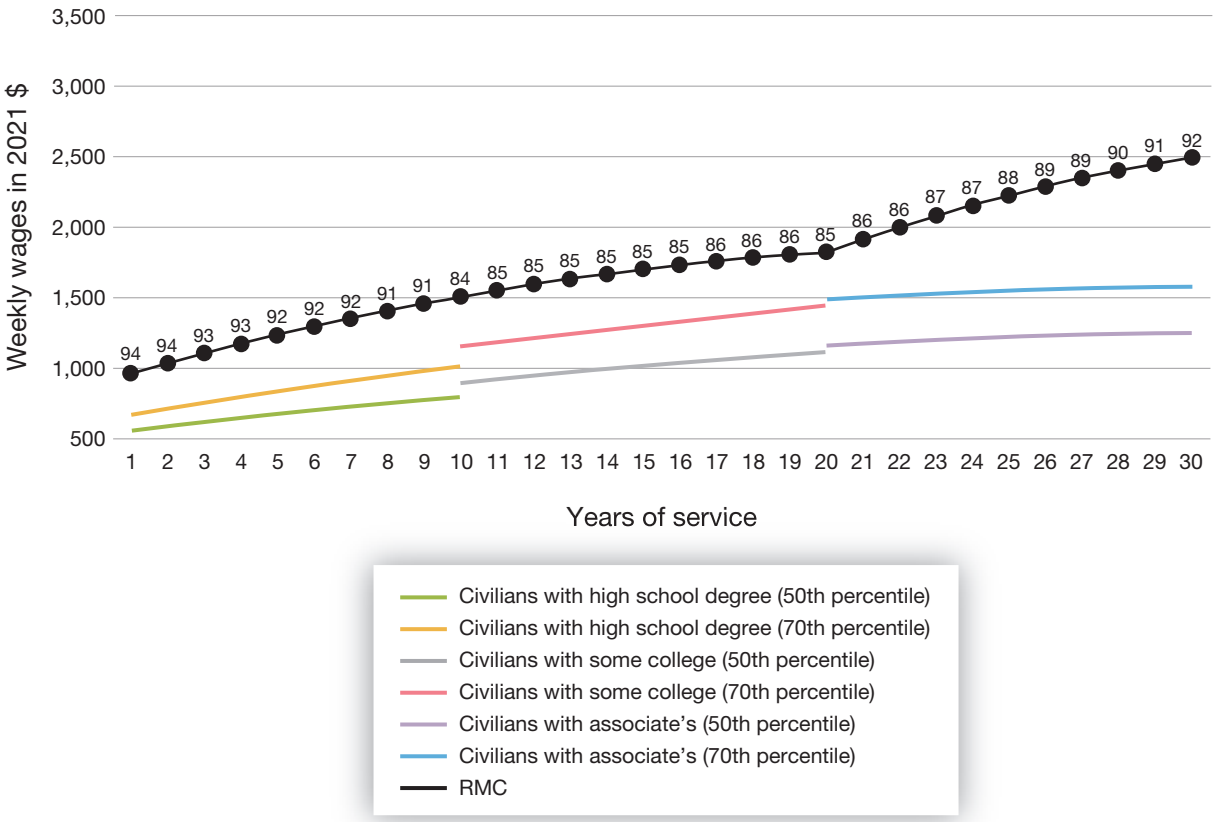
Figures 2.1 and 2.2 show the enlisted RMC over YOS in a black, dotted line. Each point is labeled with the estimated RMC percentile, which captures RMC's value relative to the earnings of its respective education comparison group. In Figure 2.1, enlisted members with fewer than ten YOS are compared the civilians with high school degrees. Their median and 70th percentile earnings are shown in green and yellow, respectively. We compare those service members with between ten and 20 YOS to civilians with some college education, where

[4] We derive military education by YOS from either the Active Duty Master File (ADMF) education data or SOFS. Details on their construction can be found in Appendix B.

[5] For a more detailed description of the summary weighted average RMC percentiles calculation, see Appendix B.

FIGURE 2.1

Enlisted Regular Military Compensation, Civilian Wages, and Regular Military Compensation Percentiles for Full-Time, Full-Year Workers with a High School Education, Some College, or Associate's Degrees, 2021



SOURCE: Authors' calculations using the Greenbook (DoD, OUSD[P&R], 2023), the March ASEC (CPS ASEC), *PopRep* (DoD, OUSD[P&R], undated), and SOFS-A (DoD, OPA, 2020b).

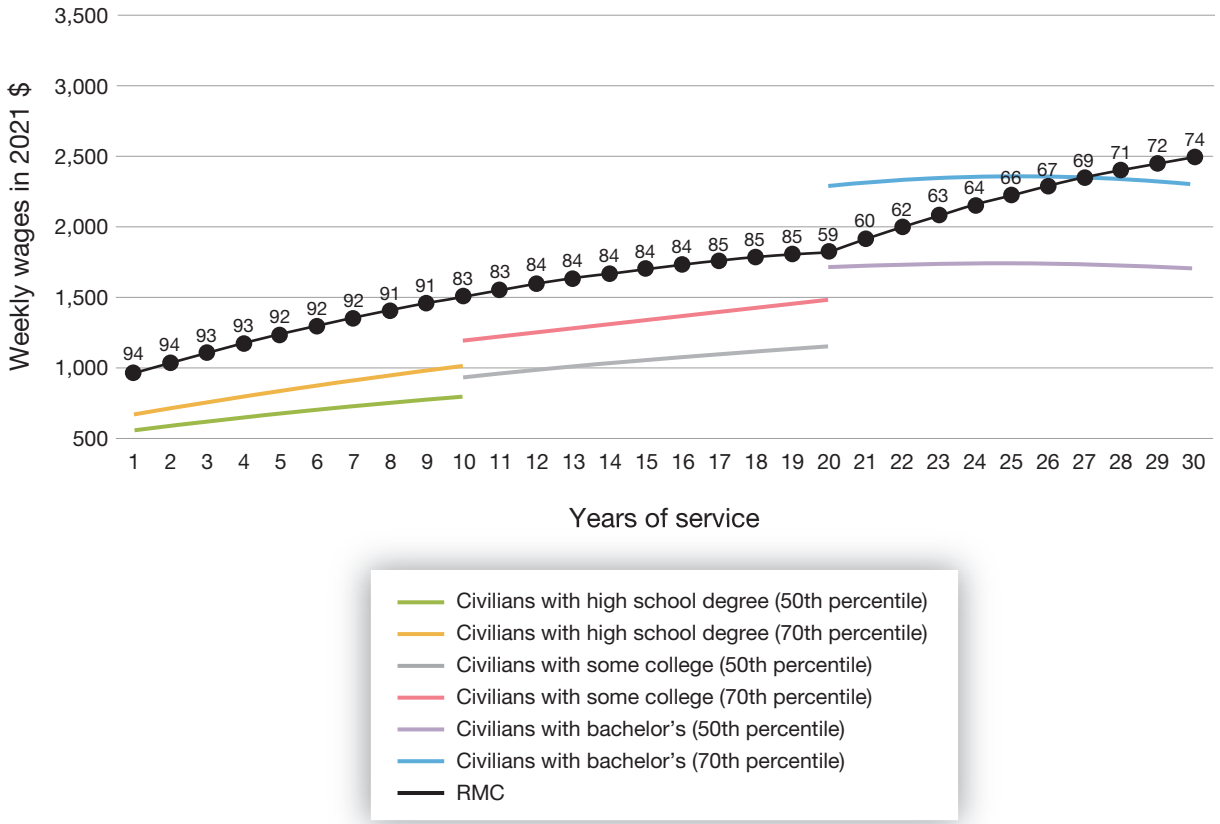
NOTE: RMC and civilian wage percentiles have been smoothed using quadratic regressions on the raw data. Civilian data are weighted by the standard CPS weights multiplied by the military enlisted gender mix. Weekly pay is expressed in 2021 dollars.

their median and 70th percentile of earnings are listed in gray and red. Finally, senior enlisted members with more than 20 YOS are compared with the 50th and 70th percentiles of earnings of civilians with associate's degrees, shown in purple and blue. Figure 2.2 is similar to Figure 2.1, except senior enlisted members with more than 20 YOS are compared with the 50th and 70th percentile of earnings of civilians with bachelor's degrees. DoD does not require enlisted members to hold a bachelor's degree, but, as shown in Table 2.4, many senior enlisted personnel have a bachelor's or higher degree.

Before discussing the results in detail, we highlight that the selection of the educational comparison group affects the estimated RMC percentile. When we compute the weighted average RMC percentiles in 2021, as described below, the percentiles are lower than those in the detailed RMC approach, as shown in Figures 2.1–2.3. The inclusion of higher-educated civilians in the weighted average RMC computation explains why the weighted average estimates are lower. For example, in Table 2.4, we see that a nontrivial share of early career service members have education beyond high school, and civilians with education beyond high school have higher earnings, so military pay compares less favorably (though still well above the 70th percentile). For example, the weighted average RMC percentile for enlisted members with one year of service is 94 for the detailed RMC in Figures 2.1 and 2.2 but is 85 in Table 2.4.

FIGURE 2.2

Enlisted Regular Military Compensation, Civilian Wages, and Regular Military Compensation Percentiles for Full-Time, Full-Year Workers with a High School Education, Some College, or Bachelor's Degrees, 2021



SOURCE: Authors' calculations using the Greenbook (DoD, OUSD[P&R], 2023), the March ASEC (CPS ASEC), *PopRep* (DoD, OUSD[P&R], undated), and SOFS-A (DoD, OPA, 2020b).

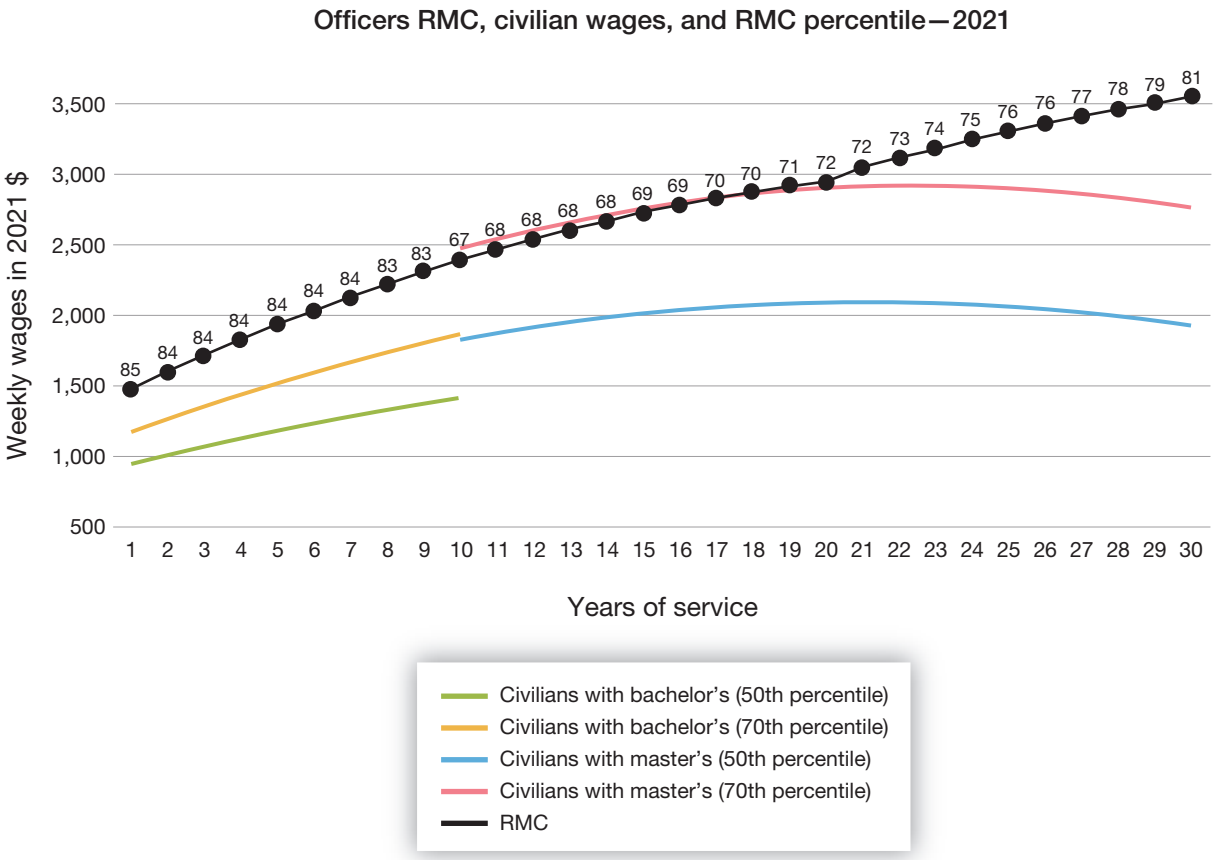
NOTE: RMC and civilian wage percentiles have been smoothed using quadratic regressions on the raw data. Civilian data are weighted by the standard CPS weights multiplied by the military enlisted gender mix. Weekly pay is expressed in 2021 dollars.

In Figures 2.1 and 2.2 we find that military pay, particularly among junior enlisted members, compares favorably to civilian pay. The calculated RMC percentiles below ten YOS are higher than the 90th percentile of earnings relative to civilians with a high school diploma. Midcareer enlisted also fare well against their civilian counterparts (i.e., those with some college education), as their estimated percentiles are well above the 70th percentile threshold. Only among senior enlisted members do the estimated percentiles fail to meet the 9th QRMC's recommendations, but, as shown in Figure 2.2, when compared with civilians with associate's degrees rather than bachelor's degrees, the estimated percentile is again well above its recommended floor. The RMC percentile for 20 YOS increases from 59 to 85 when changing the comparison group, and from 74 to 92 at 30 YOS. Whether it is appropriate to compare RMC for senior enlisted personnel with the pay of civilians with associate's or bachelor's degrees depends on whether the services require senior enlisted personnel to have such degrees and therefore require pay levels that enable them to retain such personnel. We did not identify the educational requirements of the services and thus present results that show comparisons for both groups.

In Figure 2.3 we plot officers' RMC, their RMC percentiles, and the median and 70th percentile of comparable civilian wages by YOS. The earnings of officers with fewer than ten YOS are compared with the earnings of civilians with bachelor's degrees, while senior officers are compared with advanced degree holders. The

FIGURE 2.3

Officer Regular Military Compensation, Civilian Wages, and Regular Military Compensation Percentiles for Full-Time, Full-Year Workers with Bachelor's Degrees, Master's Degrees, or Higher, 2021



SOURCE: Authors' calculations using the Greenbook (DoD, OUSD[P&R], 2023), the March ASEC (CPS ASEC), *PopRep* (DoD, OUSD[P&R], undated), and SOFS-A (DoD, OPA, 2020b).

NOTE: RMC and civilian wage percentiles have been smoothed using quadratic regressions on the raw data. Civilian data are weighted by the standard CPS weights multiplied by the military officer gender mix. Weekly pay is expressed in 2021 dollars.

RMC percentiles for junior officers are consistently above the 80th percentile of comparable civilian earnings. When the comparison group changes to those with master's degrees or higher education, the RMC percentile predictably declines, but only slightly below the 70th percentile threshold, and either meets or exceeds the threshold by the 17th year of service. From the tenth to the 30th YOS, officer RMC increases from the 67th percentile of civilian earnings to the 81st.

The Weighted Average of the Regular Military Compensation Percentile in 2021

We also calculate a single weighted RMC percentile (i.e., a summary RMC) for both enlisted members and officers so that military pay can be summarily compared with the wages of comparable civilians. In this section, we briefly explain the summary RMC percentile methodology, present the results of these findings, and, finally, compare the 2021 RMC percentiles with the values from 2017, the last year of analysis produced for the 13th QRMC.

Tables 2.4 and 2.5 present the weighted RMC percentiles in 2021 for enlisted members and officers, respectively, as well as the inputs used in their calculation. Each row in the tables represents a single year of

TABLE 2.4

Regular Military Compensation as a Percentile of Civilian Wages, by Level of Education and Year of Service, for Enlisted Members, 2021

	Predicted Education Distribution by Years of Service					Regular Military Compensation Percentile						
YOS	High School	Some College	Associate's	Bachelor's	Master's Plus	High School	Some College	Associate's	Bachelor's	Master's Plus	Weighted Average	Enlisted Count
1	0.60	0.32	0.04	0.04	0.00	90	81	83	50	37	85	234,603
2	0.49	0.37	0.08	0.06	0.00	95	87	79	55	32	88	135,822
3	0.41	0.40	0.11	0.08	0.01	96	83	75	50	18	84	118,810
4	0.35	0.41	0.13	0.09	0.01	94	88	85	51	40	86	93,904
5	0.31	0.42	0.15	0.10	0.02	91	87	82	53	34	83	67,984
6	0.28	0.43	0.17	0.11	0.02	96	83	84	58	34	83	55,146
7	0.25	0.42	0.19	0.12	0.02	92	76	86	52	38	78	46,378
8	0.23	0.42	0.21	0.13	0.02	94	86	81	57	34	82	45,437
9	0.21	0.41	0.22	0.13	0.02	92	77	80	53	37	77	38,187
10	0.19	0.40	0.24	0.14	0.02	84	81	88	48	32	77	32,400
11	0.18	0.40	0.25	0.15	0.02	90	83	92	51	32	80	28,723
12	0.17	0.39	0.26	0.16	0.03	94	94	81	61	34	83	26,495
13	0.15	0.38	0.27	0.17	0.03	92	90	86	51	34	81	24,456
14	0.14	0.37	0.28	0.18	0.04	92	89	79	58	33	79	20,964
15	0.13	0.36	0.28	0.18	0.04	92	83	83	55	31	77	22,316
16	0.12	0.35	0.29	0.19	0.05	90	80	88	59	50	78	19,058
17	0.12	0.34	0.29	0.20	0.06	87	82	83	50	35	74	20,583
18	0.11	0.33	0.28	0.21	0.07	84	87	85	55	41	76	20,386
19	0.10	0.32	0.28	0.22	0.08	94	84	66	51	36	69	20,348
20	0.10	0.30	0.27	0.24	0.09	90	80	86	51	41	72	15,392
21	0.10	0.29	0.26	0.25	0.10	93	89	86	53	33	74	11,312

Table 2.4—Continued

	Predicted Education Distribution by Years of Service					Regular Military Compensation Percentile						
YOS	High School	Some College	Associate's	Bachelor's	Master's Plus	High School	Some College	Associate's	Bachelor's	Master's Plus	Weighted Average	Enlisted Count
22	0.09	0.28	0.25	0.26	0.12	93	89	81	62	48	76	7,811
23	0.09	0.27	0.23	0.27	0.13	94	82	88	68	44	76	5,776
24	0.09	0.26	0.22	0.28	0.15	93	91	82	68	49	76	4,000
25	0.09	0.25	0.20	0.30	0.16	95	85	81	64	49	73	3,021
26	0.09	0.24	0.19	0.31	0.18	95	94	93	73	62	82	1,811
27	0.09	0.23	0.18	0.32	0.19	94	89	94	72	57	79	1,421
28	0.08	0.22	0.17	0.32	0.20	91	88	90	75	68	81	1,187
29	0.08	0.22	0.16	0.32	0.21	98	87	91	67	61	77	986
30	0.08	0.22	0.17	0.31	0.22	97	88	89	71	57	77	408
0–20											**82.7**	
0–30											**82.4**	

SOURCE: Authors' calculations using the Greenbook (DoD, OUSD[P&R], 2023), the March ASEC (CPS ASEC), *PopRep* (DoD, OUSD[P&R], undated), and SOFS-A (DoD, OPA, 2020b).

NOTE: The predicted education distribution is derived from SOFS data (see Table 2.1) and the joint distribution of personnel by pay grade and YOS for the 2021 Greenbook. The RMC percentiles for each education level represent comparisons between RMC and civilian earning at each respective education and age (i.e., YOS) level. We calculate the weighted average RMC for each year of service using each education level's RMC percentile and using the share of personnel with each education level as weights. We calculate the enlisted count using the DMDC's active duty pay files from September 2021. The summary weighted average RMC percentiles for 0–20 YOS and 0–30 YOS are averages of the individual weighted RMC percentiles weighted by enlisted count.

TABLE 2.5

Regular Military Compensation as a Percentile of Civilian Wages, by Level of Education and Year of Service, for Officers, 2021

	Predicted Education Distribution		Regular Military Compensation Percentile			
YOS	Bachelor's	Master's Plus	Bachelor's	Master's Plus	Weighted Average	Officer Count
1	0.90	0.10	80	69	79.2	20,688
2	0.82	0.18	86	65	82.5	13,097
3	0.75	0.25	85	57	78.0	12,213
4	0.69	0.31	90	81	87.6	11,347
5	0.62	0.38	83	71	78.5	9,063
6	0.57	0.43	85	60	74.3	8,500
7	0.51	0.49	86	69	77.4	7,725
8	0.46	0.54	84	70	76.6	7,993
9	0.42	0.58	77	67	70.9	7,205
10	0.37	0.63	80	70	73.6	7,031
11	0.33	0.67	82	61	67.8	6,703
12	0.30	0.70	88	66	72.7	6,864
13	0.27	0.73	84	74	76.9	6,801
14	0.24	0.76	85	62	67.2	6,269
15	0.21	0.79	83	68	71.2	6,163
16	0.19	0.81	82	77	77.7	6,045
17	0.17	0.83	81	71	72.8	6,555
18	0.15	0.85	83	66	68.4	6,411
19	0.13	0.87	77	64	65.8	6,454
20	0.12	0.88	84	72	73.8	5,677
21	0.11	0.89	83	70	71.5	4,825
22	0.10	0.90	87	70	71.4	4,020
23	0.09	0.91	89	68	69.9	3,638
24	0.09	0.91	90	75	76.1	3,336
25	0.08	0.92	89	77	78.2	2,824
26	0.08	0.92	90	79	79.8	2,348
27	0.08	0.92	87	80	80.1	2,110
28	0.08	0.92	87	86	85.6	1,861
29	0.08	0.92	83	74	74.4	1,723
30	0.08	0.92	88	77	78.2	1,258
0–20					**75.9**	
0–30					**75.8**	

SOURCE: Authors' calculations using the Greenbook (DoD, OUSD[P&R], 2023), the March ASEC (CPS ASEC), *PopRep* (DoD, OUSD[P&R], undated), and SOFS-A (DoD, OPA, 2020b).

NOTE: The predicted education distribution is derived from SOFS data (see Table 2.1) and the joint distribution of personnel by pay grade and YOS for the 2021 Greenbook. The RMC percentiles for each educational level represent comparisons between RMC and civilian earning at each respective education and age (i.e., YOS) level. We calculate the weighted average RMC for each year of service using each education level's RMC percentile and using the share of personnel with each education level as weights. We calculate the officer count using the DMDC's active duty pay files from September 2021. The summary weighted average RMC percentiles for 0–20 YOS and 0–30 YOS are averages of the individual weighted RMC percentiles weighted by enlisted count.

service. For each year of service the tables then list the portion of service members that belong to each education category ("Predicted Education Distribution by YOS") and where military pay falls relative to the earnings of civilians with those educational credentials ("RMC Percentile"). The "Weighted Average" then shows the average RMC percentile for that year of service, using the RMC percentiles by education and the portion of service members with the corresponding education as weights. The summary weighted average RMC percentiles, which compare military pay with similar civilians' pay across the entire career, are calculated by averaging the YOS-level weighted average RMC percentiles using the "Enlisted Count" as weights. We present two summary weighted average RMC percentiles, one that only includes 20 YOS or fewer (found in the 0–20 row), and a second that uses all 30 YOS in the table (in the 0–30 row).

We find that RMC is well above the 70th percentile threshold in both YOS specifications. Using only the first 20 YOS in our calculation, we estimate that enlisted RMC is at the 82.7th percentile of comparable civilian pay and, with all 30 YOS, at the 82.4th. The 2021 RMC percentiles are just below their values in 2017, which were 84.6 and 84.1, respectively, suggesting that the pay of comparable civilians has just outpaced military pay in the four years since the 13th QRMC, likely due to tightening in the civilian labor market discussed in Appendix A.

The weighted average RMC percentiles for officers is found in Table 2.5. Its structure differs from the tabulations for enlisted personnel in Table 2.4 only in its exclusion of irrelevant educational categories (i.e., high school, some college, and associate's degrees), because only on rare occasions do officers access without at least bachelor's degrees. We estimate the weighted average RMC percentiles for officers to be 75.9 and 75.8, for less than or equal to 20 and 30 YOS, respectively, which, like their enlisted counterparts, are below the 2017 values of 76.7 and 76.4.

Discussion of Findings

The percentile comparisons indicate that average military pay, as measured by RMC, continues to compare well relative to the earnings of civilians of similar education levels and ages. Whether military pay levels are adequate, however, must be judged not only on how military pay compares with civilian pay but also on whether the services are able to recruit and retain the personnel needed to meet their manpower objectives.[6] Recent retention trends indicate that the services have experienced strong retention overall, generally reaching at least 100 percent of their active duty reenlistment mission among service members ending their initial obligation and those at midcareer (see Table 2.6). Officer retention has also been strong overall, with annual continuation rates at the eighth year of service at around or exceeding 90 percent in recent years (see Figure 2.4).

The main challenge for the services in recent years has been recruiting, especially for the Army. As shown in Figure 2.5, the Army, Navy, and Air Force fell short of their active duty enlistment objectives in FY 2023 while the Army also missed its 2022 objective, by around 25 percent, as well as its 2018 objective. On the other hand, since 2017, all of the services have exceeded the OSD benchmark that at least 90 percent of enlisted accessions be high school diploma graduates. And, with the exception of the Navy, all of the services have met or exceeded the OSD benchmark that 60 percent or more of accessions have Armed Forces Qualification Test (AFQT) scores of at least 50. In 2023, 54 percent of the Navy's accessions had at least a score of 50, and 19.4 percent had scores between 10 and 30 (DoD, OUSD[P&R], 2023). Overall, however, recruit quality has remained strong.

[6] It is important to acknowledge that other aspects of the compensation package also affect retention, including the military retirement benefit and the value of the military health benefit, among others. That said, debates about the adequacy of military pay generally come to the forefront when recruiting objectives are not being met and the services are experiencing retention challenges.

TABLE 2.6

Active Duty Retention, Percentage of Annual Reenlistment Mission Achieved, by Zone of Eligibility

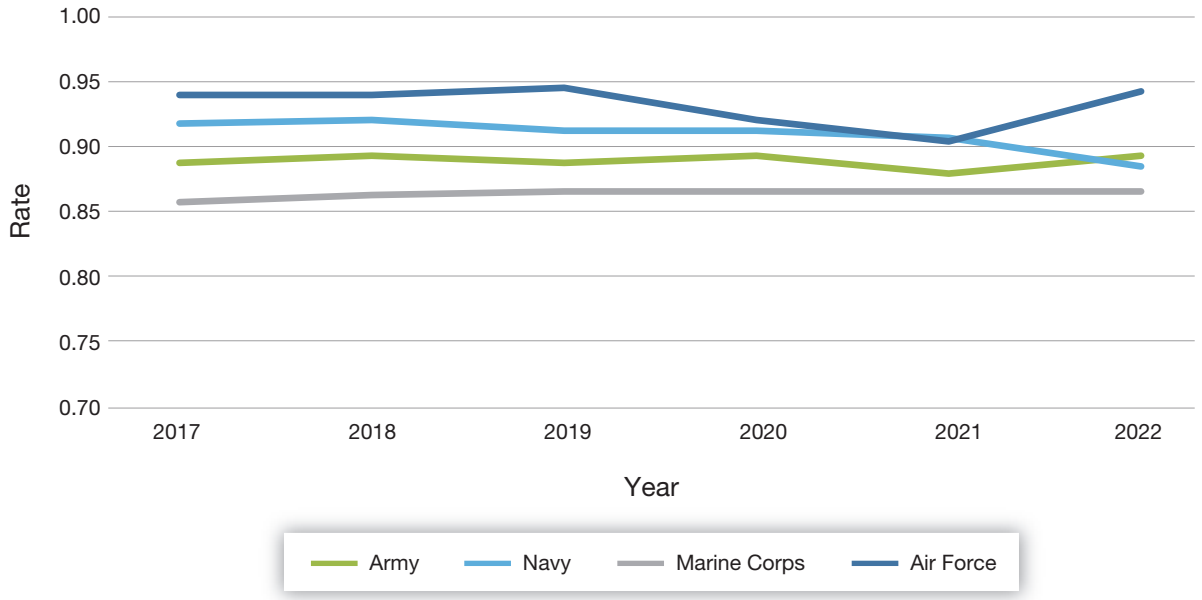
	2017	2018	2019	2020	2021	2022	2023
Initial zone							
Army	96%	105%	101%	104%	102%	103%	102%
Navy	100%	118%	112%	93%	103%	108%	117%
Marine Corps	96%	99%	98%	101%	95%	102%	114%
Air Force	125%	115%	130%	125%	127%	118%	127%
Midcareer zone							
Army	99%	105%	101%	105%	103%	104%	102%
Navy	116%	126%	113%	90%	94%	107%	97%
Marine Corps	96%	111%	99%	105%	100%	107%	106%
Air Force	93%	118%	129%	116%	115%	105%	100%

SOURCE: DoD, OUSD[P&R], 2017–2023.

NOTE: The Marine Corps midcareer zone includes retention subsequent to the initial zone.

FIGURE 2.4

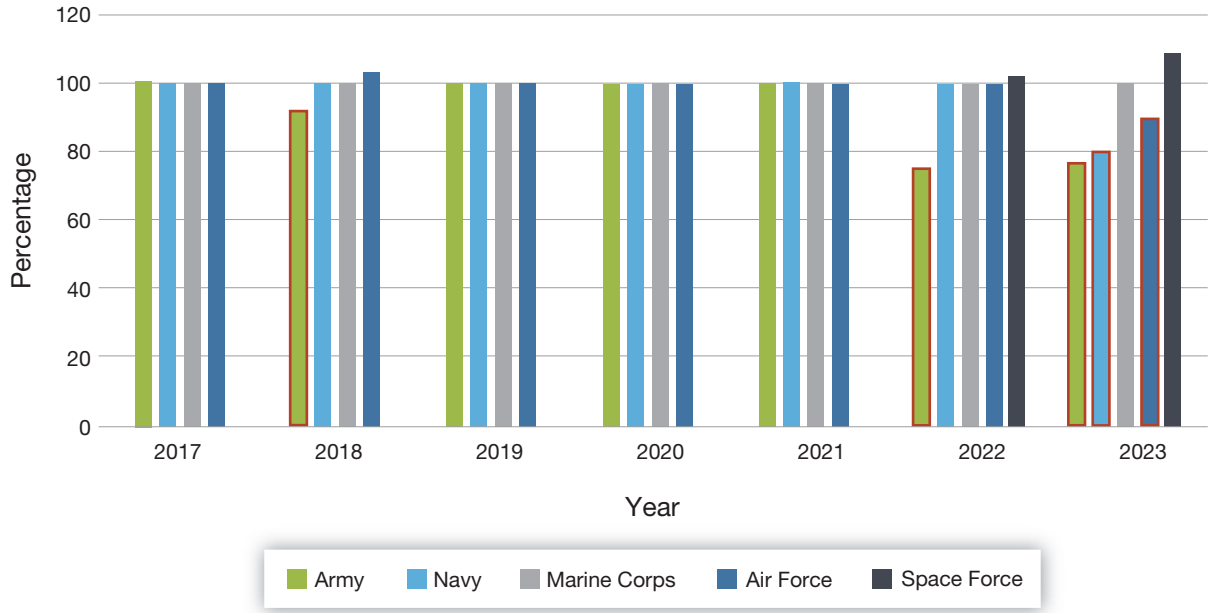
Active Duty Officer Continuation Rate at the Fourth Year of Service



SOURCE: DMDC tabulations provided to RAND.

While research (Asch et al., 2010; Simon and Warner, 2007; Warner and Simon, 2004; Warner, Simon, and Payne, 2003) shows that the supply of recruits to the military is responsive to increases in military pay relative to civilian pay, the recent recruiting challenges do not provide a compelling reason to increase military pay relative to civilian pay, for two reasons. First, such pay raises only make sense when the services are also experiencing retention problems, since research shows that retention is also responsive to pay raises (Asch et al., 2010). However, the services are not experiencing such problems in general.

FIGURE 2.5
Percentage of Active Duty Enlistment Mission Achieved by Fiscal Year



SOURCE: DoD, OUSD[P&R], 2017–2023.
NOTE: A red outline indicates a service that did not achieve active duty enlistment mission (100%).

Second, as discussed further in Chapter 3, raising military pay is not a cost-effective recruiting policy relative to other policy levers. Research shows that increasing the number of recruiters, expanding advertising, and even increasing enlistment bonuses are more cost-effective (Dertouzos and Garber, 2003; Hogan et al., 1996; Knapp et al., 2018; Simon and Warner, 2007; Ward et al., 2023; Warner and Simon, 2004; Warner, Simon, and Payne, 2003). The reason that raising pay is not cost-effective is because the increase in pay would apply not just to new recruits but to other service members, resulting in substantial economic rents being paid to members who were planning to stay, even without a pay raise. In addition, pay increases are permanent, unlike bonuses and advertising, which can both be reduced or eliminated if no longer needed. Finally, other elements of military compensation depend on basic pay, such as the military retirement accrual charge, as well as the DoD's Federal Insurance Contribution Act tax to fund Social Security—further increasing the cost of a pay increase.

DoD and the services are working hard to address their recruiting challenges (Vazirani, 2023). Efforts include expanding the use of enlistment bonuses and increasing marketing and advertising. The Army and Navy are expanding the share of applicants who are eligible to enlist through the Future Soldier Preparatory Course and the Future Sailor Preparatory Course, respectively; these allow applicants who do not meet weight or aptitude requirements to train and achieve these standards. DoD is also running the Medical Accessions Records Pilot to allow applicants who previously required a waiver to enlist to enter without a waiver, and each of the services are making extensive use of waivers, thereby increasing the share of applicants who can enlist. In addition, some of the services have increased the size of their recruiter workforces and expanded the number of recruiting stations across the country and are in the process of reorganizing and reengineering their recruiter organization and management approaches. Finally, some of the services are expanding their outreach to new markets, such as the college market.

Should the 70th Percentile Benchmark Be Changed?

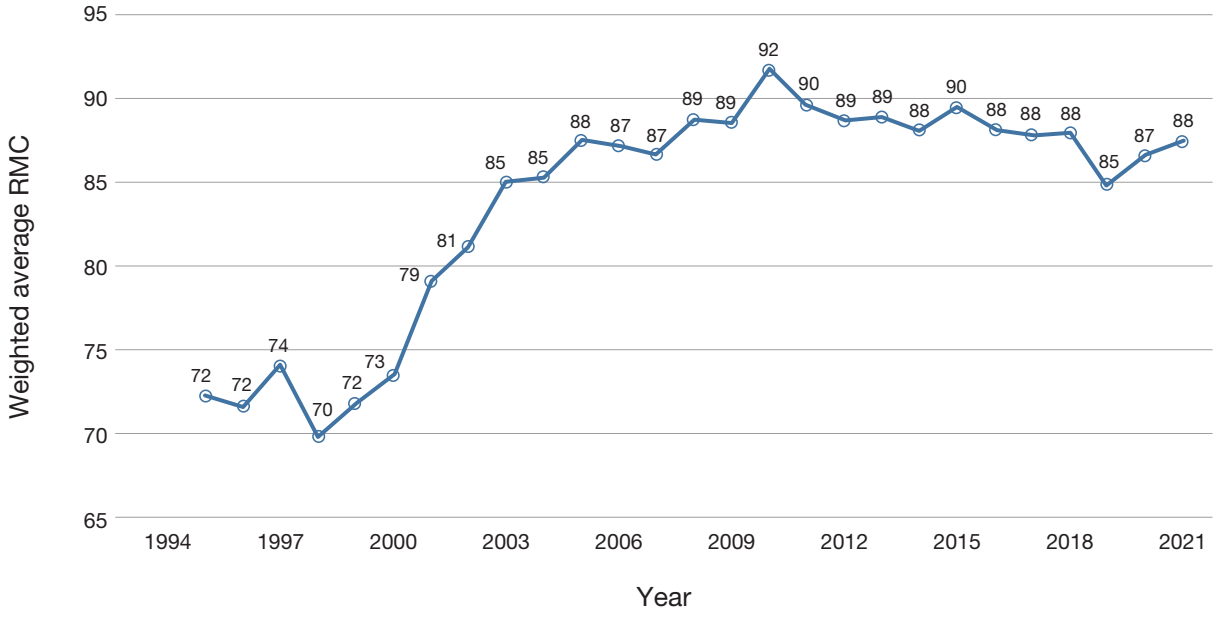
As noted at the beginning of this chapter, Section 643 of H.R. 7900 in the NDAA for FY 2023 requested that the study of basic pay include an analysis of how military pay compares with civilian pay since the 70th percentile benchmark was established and address whether the 70th percentile benchmark should be changed. Figures 2.6 and 2.7 show that average RMC has exceeded the 70th percentile for quite some time for both enlisted members and officers.

Figure 2.6 presents the summary weighted average RMC percentiles using the methodology shown in Table 2.3, while Figure 2.7 shows comparisons for officers. Average RMC in the figures is based on tabulations from the DoD Greenbook, using the education distribution from the ADMF, and we compute the overall weighted average RMC for the first through 20th YOS for each year from 1994 through 2021 based on the number of personnel by YOS as listed in the Greenbook.[7]

Through the mid-1990s, weighted enlisted RMC across all YOS hovered around the 73rd percentile of the wage distribution of similarly educated civilians and reached a low of about 70 in 1998. Enlisted RMC then began a steady climb and reached the 92nd percentile of the civilian wage distribution in 2010. It stayed relatively constant at around the 88th percentile until 2018, dipped to the 85th percentile in 2019, and reverted

FIGURE 2.6

Enlisted Regular Military Compensation as a Percentile of Civilian Wages Weighted by Level of Education and Year of Service, with Education Estimated from the Active Duty Master File, 1994–2021



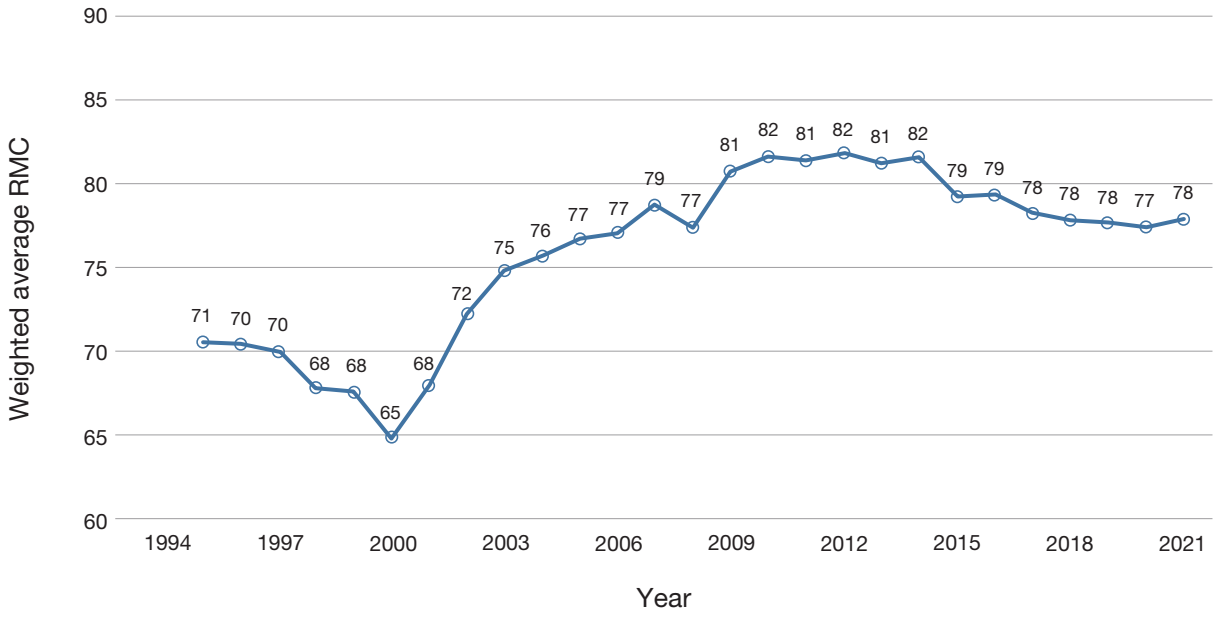
SOURCE: Authors' calculations using the DMDC's ADMF, the Greenbook (DoD, OUSD[P&R], 2023), the March ASEC (CPS ASEC), *PopRep* (DoD, OUSD[P&R], undated), and SOFS-A (DoD, OPA, 2020b).

NOTE: These weighted average RMC percentiles (or summary percentiles) follow the same methodology used in Table 3.3 but use the DMDC education data instead of SOFS-A data, as this allows us to make comparisons annually and back to 1994.

[7] We use the educational distributions from the ADMF rather than SOFS-A because we only have SOFS-A data since the early 2000s, while ADMF data go further back in time.

FIGURE 2.7

Officer Regular Military Compensation as a Percentile of Civilian Wages Weighted by Level of Education and Year of Service, with Education Estimated from the Active Duty Master File, 1994–2021



SOURCE: Authors' calculations using the DMDC's ADMF, the Greenbook (DoD, OUSD[P&R], 2023), the March ASEC (CPS ASEC), *PopRep* (DoD, OUSD[P&R], undated), and SOFS-A (DoD, OPA, 2020b).

NOTE: These weighted average RMC percentiles (or summary percentiles) follow the same methodology used in Table 3.3 but use DMDC education data instead of SOFS-A, as this allows us to make comparisons annually and back to 1994.

to the 88th percentile in 2021.[8] Weighted officer RMC also increased steadily through the early 2000s, reaching the 81st percentile in 2009. It stayed just above or just below the 80th percentile through 2021. In short, average RMC has exceeded the 70th percentile since the late 1990s when the 70th percentile was established, owing to the faster-than-ECI pay raises that occurred in the early 2000s.

Comparison of Recruiting and Retention Outcomes and Other Factors to Earlier Years

To address the second issue raised in Section 643 of H.R. 7900 of the 2023 NDAA, regarding whether the 70th percentile should be changed, it is useful to recall that the adequacy of military pay should ultimately be based on meeting the objectives of military compensation (and, particularly, on the services' recruiting and retention success in meeting their manpower requirements) rather than on specific pay comparisons. Further, as noted earlier, past research shows that bonuses, recruiters, and advertising are more cost-effective

[8] In Appendix B, we discuss the dip in the average percentile in 2019 and our hypothesis that the dip may reflect a bias owing to a drop in response rates in the CPS during the COVID-19 pandemic. As we have noted, the CPS is our data source for civilian wage data. Data for 2019 were collected in early 2020, and the pandemic prohibited in-person surveys, resulting in a dramatic drop in CPS response rates. Research by the U.S. Census Bureau suggests that nonresponse disproportionately occurred among lower-income people, thereby inflating the estimated civilian earnings in 2019 by 2.8 percent. In consequence, average RMC compared less well with civilian pay in 2019, especially for enlisted members who would be more affected by nonresponse of lower-income people.

policies than pay to increase high-quality enlistments, implying that even if the services are struggling to meet recruiting requirements, an increase in pay is not necessarily the appropriate policy response.

That said, the 70th percentile benchmark has been the starting point for discussions about pay adequacy, as noted earlier in this chapter. Its purpose has come to be as a type of early warning system for assessing pay adequacy among policymakers such that if pay falls short of the benchmark, it signals the need for a closer look at whether pay is sufficiently competitive, whether the services are able to meet their recruiting and retention requirements, and, if not, whether pay or other resources are the appropriate policy response. However, past discussions of the 70th percentile benchmark, other than analysis for the 13th QRMC, have not considered what happens when average RMC exceeds the 70th percentile benchmark, as has been the case since about 2005, as we show below. On the one hand, it is possible that the benchmark should be raised to be closer to the higher percentile levels seen today. Such would be the case if the services are less able to meet their recruiting and retention objectives when average pay falls below the higher benchmark, thereby implying that the "early warning" percentile should be higher. On the other hand, if the services have exceeded their objectives at the current higher percentiles, then the services are likely paying more than needed to achieve their objectives—that is, economic rents—and the growth of military could be slowed so that average pay moves closer to the 70th percentile.

This suggests that an assessment of whether the 70th percentile benchmark should be changed—and, specifically, be increased—should evaluate whether the services fell short of their recruiting and retention objectives when average RMC fell below the higher percentiles observed over the past 20 years or whether they have exceeded these objectives at the higher percentiles. The assessment should also account for other changes that may have occurred, including changes in bonuses and other recruiting and retention resources and changes in environmental factors such as the state of the economy. A challenge in conducting such an assessment is that the percentiles have been generally steady in recent years; average RMC has not significantly fallen below these higher levels though it has varied a bit over time. Furthermore, with the recent exception of recruiting, the services have generally met or exceeded their objectives, as we discuss further below, and even with recent recruiting challenges, military pay is not the most cost-effective means of addressing recruiting shortfalls, especially when retention is strong. A final challenge is that the objectives in a year may reflect the services' recruiting and retention success. For example, within a fiscal year, the services set recruiting and retention objectives based on overall end-strength targets, but they might decrease recruiting objectives if retention is unexpectedly strong, or they might increase retention objectives if recruiting is weak. Across fiscal years, the objectives reflect changes in overall end-strength goals.

Our approach is more qualitative and builds on analysis conducted for the 13th QRMC and summarized in Asch et al. (2020).[9] We compare the recruiting and retention outcomes in 2018–2023 (since the analysis in the earlier report) with those in the late 1980s and mid-1990s; the late 1980s and mid-1990s were periods that roughly correspond to the data used by past studies that led to the establishment of the 70th percentile and were deemed successful in terms of recruiting and retention. In addition, we examine whether the services have achieved better outcomes at the higher RMC percentiles relative to the outcomes in these earlier periods and consider selected factors that might have made recruiting and retention easier or harder, including changes in recruiting and retention resources and environmental factors. We consider whether the higher percentiles above the 70th percentile have resulted in about the same outcomes, after considering other factors (suggesting

[9] Asch et al. (2020), analyze data through 2018 and show that the average RMC percentile exceeded the 70th percentile benchmark since the late 1990s, reflecting the relatively fast military pay growth in the early 2000s to 2010, as well as a downward trend in real civilian wages. The study also considered recruiting and retention outcomes in 2018–2019 compared with outcomes for 1988–1989 and 1993–1997—the periods that were relevant to the studies that led the 70th percentile being set as the benchmark for military pay levels. It found that, overall, recruit quality and retention outcomes were strong, despite a lower unemployment rate. Nonetheless, the study argued that an RMC percentile benchmark above the 70th could be appropriate given increased difficulties recruiting and retaining personnel and the likelihood that the services would continue to require high-quality personnel, though the study did not recommend a specific new benchmark.

that a higher percentile might be needed to achieve the same outcomes), or whether they have resulted in better outcomes (suggesting the possibility that the services are paying economic rents, and the growth of military pay might be slowed so that average RMC is closer to the 70th percentile).

Table 2.7 shows that the weighted average RMC percentile for enlisted personnel was 87, averaged over the 2018–2021 data period, far exceeding the 70th percentile benchmark. The enlisted average also exceeds the 75 average enlisted percentile for the 1993–1997 period and the 73 percentile for 1988–1989 period. As noted above, both recruiting and retention has been strong, notwithstanding the missed recruiting missions in 2022–2023, as well as in 2018 for the Army.

Table 2.7 also shows that, relative to the earlier periods corresponding to the data periods that were the basis for the establishment of the 70th percentile, recruit quality has remained relatively unchanged in recent years and retention has been stronger. Specifically, 68.1 percent of recruits across the DoD were in AFQT categories 1–3A in the recent period, compared with 70.4 percent in the mid-1990s and 65.5 percent in the late 1980s. The percentage that were at Tier 1 was 95.2 percent in the recent period, about the same as the percentage in the mid-1990s (95.4 percent) and a bit higher than the 92.5 percent figure for the late 1980s. Notably, recruit quality exceeded the benchmarks recently, as well as in the earlier periods. DoD does not set specific objectives for retention; this is left to the individual services. We find that retention rates at key career milestones (the fourth and eighth YOS) were higher on average in 2018–2023 than they were in the two earlier periods. Overall, these comparisons of recruiting and retention outcomes in recent years to those of the earlier periods corresponding to when the 70th percentile was established indicates that, notwithstanding the missed accession missions in recent years, the services have met or exceeded the outcomes from the earlier years.

It is possible that the sustainment of recruit quality and improved retention reflect not just military pay that exceeds the 70th percentile in recent years but also increases in recruiting and retention resources other than pay. Table 2.7 shows that the services maintained a larger recruiter force on average between 2018 and 2023, equal to 15,101, than in the two previous periods, equal to 11,967 and 12,796, respectively, while average enlistment and reenlistment bonus budgets across DoD have increased in real value in the more recent years. On average, the services budgeted about $500 million on enlistment bonuses in 2023 dollars, and over $1 billion on reenlistment bonuses, far higher than the amounts budgeted in either the 1993–1997 or 1988–1989 periods. Thus, the improvements could reflect increases in bonuses.

Recruit quality and improved retention could also reflect improvements in some conditions of service. The table shows evidence of fewer deployments, as measured by the number of service members receiving imminent danger pay or hazardous duty pay, relative to the late 1990s. And active duty members report fewer duty days where they work overtime, 84 days in the last 12 months in the recent period compared with 138 in 2003.[10] Finally, while trust in the military among the American public has declined since 2018, the decline occurred relative to a high level of trust that began after 9/11. Consequently, relative to the two earlier periods, the average percent of adults expressing a "great deal/quite a lot" of trust in the military has increased to 68.7 percent in the Gallup poll data (Younis, 2023).

Finally, the improvements relative to the earlier periods could simply reflect lower accession and retention objectives. As is shown in Table 2.7, active duty end strength decreased dramatically, notably owing to the post–Cold War drawdown in the 1990s. The reduction is reflected in the reduced accession objectives over time, falling from an average of about 290,000 in 1988–1989 to an average of about 160,000 between 2018 and 2023. Economic theory implies that if military pay were efficiently set, reduced demand for manpower should result in a reduction in military pay relative to civilian pay, all else being equal.

The sustainment of recruit quality and the strong retention achieved in recent years given increased resources, improvements in some conditions of service, and reduced end-strength requirements suggest that

[10] As indicated in the table note, the earliest data available on days worked overtime are from 2003.

TABLE 2.7

Weighted Average Enlisted and Officer Regular Military Compensation Percentiles, Department of Defense Recruiting and Retention Outcomes, and Selected Factors Related to Outcomes, 2018–2023 and Selected Benchmark Years

Factor	Average 2018–2023	Average 1993–1997	Average 1988–1989
Officer RMC percentile[a]	79	71	71
Enlisted RMC percentile[a]	87	75	73
Recruiting[b]			
Accession mission	159,928	189,975	290,343
Percentage accession mission achieved	95.2%	100.2%	100.5%
Percentage Tier 1 (high school degree graduate or at least 15 college credits)	96.8	95.4	92.5
Percentage AFQT Categories 1–3A	68.1	70.4	65.5
Retention[b]			
Enlisted continuation rate at the 4th year of service	94%	63%	62%
Enlisted continuation rate at the 8th year of service	90%	84%	87%
Officer continuation rate at the 8th year of service	92%	89%	88%
Recruiters[b]	15,101	11,967	12,796
Annual accessions per recruiter[b]	10.2	15.9	22.7
Enlistment bonuses ($1,000)[c]	$529,019	$48,357	$113,369
Reenlistment bonuses ($1,000)[c]	$1,122,752	$386,126	$865,952
Deployments (number of service members receiving imminent danger pay or hazardous duty pay)[d]	22,397	41,770	5,947
Average number of duty days worked longer than normal in the past 12 months among active duty members[e]	84	138[f]	N/A
Percentage of Americans expressing a "great deal/quite a lot" of trust in the military[g]	68.7%	64.2%	60.5%
Adult unemployment rate[h]	4.9%	5.8%	5.4%
Percentage of young people with positive enlistment propensity[i]	10.9%	14.2%	18%
Enlisted end strength[b]	1,078,229	1,277,637	1,815,034
Percentage of active duty members[e]			
Satisfied or very satisfied with the military way of life	54%	67%[f]	N/A
Reporting greater than usual work stress	46%	42%[f]	N/A
Percentage of active duty spouses who favor their spouses staying in military[j]	57%	61%[k]	N/A

[a] The RMC percentile for 2018–2023 includes only 2018–2021.

[b] DoD, OUSD[P&R], and tabulations provided by the DMDC.

[c] Constant 2023 dollars.

[d] DoD, 2018, for 1988–1989 and 1997–1999; Department of the Air Force, Fiscal Year 2018–2023 Budget Estimates, Military Personnel Appropriation; Department of the Army, Fiscal Year (FY) 2018–2023 Budget Estimates, Military Personnel, Army Justification Book; Department of the Navy, Fiscal Year (FY) 2018–2023 Budget Estimates, Justification of Estimates, Military Personnel, Marine Corps; and Department of the Navy, Fiscal Year (FY) 2018–2023. Budget Estimates, Justification of Estimates, Military Personnel, Navy.

[e] DoD, OPA, 2008; DoD, OPA, 2021. The data for 2018–2023 only include 2019 and 2020 responses.

[f] Response is for the year 2003, not 1993–1997.

[g] Younis, 2023; the poll asks a random sample of adults how much confidence they have in the military.

[h] BLS, undated c.

[i] DoD, OPA, 2024. Positive enlistment propensity is measured as the percentage of young people ages 16–21 who respond "Definitely" or "Probably" to the question "How likely is it that you will be serving in the military in the next few years?" Note that data for 1993–1997 and 1988–1989 are drawn from the Youth Attitude Tracking Study, a predecessor survey to the currently used Youth Poll (DMDC, 2002).

[j] DoD, OPA, 2011; DoD, OPA, 2020a; DoD, OPA, 2023. The data for 2018–2023 only include 2019 and 2021 responses.

[k] Response is for the year 2006, not 1993–1997.

the RMC percentiles above the 70th percentile benchmark observed in recent years may be higher than needed to achieve the outcomes of the late 1980s and mid-1990s. On the other hand, other factors have become more challenging. In the case of recruiting, fewer young people express an interest in joining the military, as shown in Table 2.7. In the late 1980s, 18 percent of young people said they definitely or probably would join the military, while in the 2018–2023 period, the average is about 10 percent. Although most people who eventually join the military come from the negatively inclined group (as discussed in Asch, 2023), recruiting becomes more difficult when more young people must be recruited from this group. In addition, only about one-fourth of American youth in 2020 would meet enlistment standards without a waiver, a decrease from roughly 30 percent eligibility rate estimated in 2013 (Asch, 2023). Furthermore, as discussed in Asch et al. (2020), many young people are disqualified for medical reasons especially weight (Orvis et al., 2018), raising concerns about the rising trend in youth obesity. The increasing trend toward legalization of marijuana at the state and local level (Kilmer and MacCoun, 2017; Pacula and Smart, 2017) means that more military applicants must receive a waiver if they have a history of marijuana use given that marijuana use is still a federal offense. Documented cases of behavioral health issues are increasing among American youth, including attention deficit hyperactivity disorder, depression, and anxiety (Danielson et al., 2018; Keyes et al., 2019) and, in some cases, such as cases of self-harm, waivers are not granted.

The state of the economy also poses a challenge to both recruiting and retention success. Research shows that low unemployment means stronger job opportunities in the external market, and it is associated with reduced high-quality accessions and reenlistment (Asch and Warner, 2018). Table 2.7 shows that the adult civilian unemployment rate averaged 4.9 percent, below the average rates in 1993–1997 or 1988–1989. At the same time, as is discussed in Appendix A, the LFP rate of young men has declined, with fewer young men engaged in the world of work; the average number of hours devoted to leisure activities has been increasing, as has part-time work.

Table 2.7 also shows that despite the increase in the number of recruiters, recruiter productivity—measured as annual accessions per recruiter—has declined over time. During the 1988–1989 period, average productivity was 22.7 accessions, but was down to 10.2 on average between 2018 and 2023. It is unclear why recruiters are less productive; it may be due to a more challenging recruiting market, as indicated by reductions in propensity to enlist. It could also be because recruiters are not managed as effectively as they were in the past, so they expend less effort or divert effort to less productive activities.

The bottom rows of Table 2.7 summarize survey responses that indicate some potential areas for concern that could make meeting retention objectives more challenging. The percentage of active duty members who say they are satisfied with the military way of life has drifted downward relative to 2003, from 67 percent to 54 percent in the more recent period. The share who report more than usual work stress has also decreased, while the share of active duty spouses who say they are in favor of their spouse staying in the military has declined, from 61 percent in 2006 (the earliest year for which we have data) to 57 percent in the more recent period.

These challenges suggest that aspects of recruiting—and, possibly, retention—have become more difficult than in the periods that were used to establish the 70th percentile benchmark; many of the factors do not appear to be transitory, a conclusion we also reached in our earlier analysis (Asch et al., 2020). These challenges suggest that an RMC percentile benchmark above the 70th could be appropriate even with the factors that have made recruiting and retention less challenging, including a reduced end-strength requirement. But what is the right number? We do not have a specific number to offer, but we believe a figure of around the 75th to 80th percentile for enlisted personnel and around the 75th percentile for officers could be in the right ballpark to help address these challenges. That said, the adequacy of the military pay levels should ultimately be judged based on the services' ability to attract and retain the quantity and quality of personnel they need. In considering a higher benchmark for enlisted members and officers, future QRMCs should be required to periodically revisit any new benchmark to ensure that it remains relevant.

CHAPTER 3

Junior Enlisted Basic Pay

In the spring of 2023, members of the U.S. Congress proposed alternative approaches to increase the basic pay of junior enlisted service members in the pay grades of E-1 through E-4. As part of its support for the review of basic pay table mandated by its charter, the 14th QRMC asked the RAND NDRI to analyze these proposals and to develop and analyze additional proposals to increase E-1 through E-4 basic pay. This chapter summarizes this analysis.

Concerns about food insecurity among military personnel has put a spotlight on junior enlisted pay. The Office of the Secretary of Defense for Personnel and Readiness (OUSD[P&R]) reported in July 2022 that 24 percent of active duty members experienced food insecurity, with junior enlisted members experiencing the highest rate of food insecurity according to the 2020 SOFS-A (DoD, OUSD[P&R], 2022b). The food insecurity rate among military personnel is higher than the rate among similar civilians (Asch et al., 2023), which is surprising given that average RMC is above the 70th percentile of the earnings of similar civilians. Nonetheless, policymakers have focused on pay for junior enlisted members as a means of addressing food insecurity in the military.[1] Recruiting challenges across the services have further highlighted concerns about the adequacy of entry pay. The Army only reached 75 percent of its FY 2022 active enlisted accession mission. While the other services met their active duty enlisted accession missions, they started FY 2023 with a significantly lower delayed entry pool, and only the Navy met its FY 2022 reserve recruiting mission.

In April 2023, service representatives reported improved recruiting outcomes, but the Department of the Air Force, Army, Navy, and representatives stated that they expect to miss their respective active enlisted accession missions in FY 2023 (U.S. House of Representatives, Armed Services Committee, 2023). Retention, on the other hand, is in good shape. The Department of the Air Force, Army, Navy, and Marine Corps reported to OSD that they exceeded their retention goals for initial, midcareer, and career personnel in FY 2022 and are on track to meet their FY 2023 goals, as shown in Figure 2.5 (DoD, OUSD[P&R], 2023).

To develop basic pay proposals for junior enlisted members, we drew from relevant background materials, including trends in enlisted pay and the history of how junior enlisted pay has been set, results from the 13th QRMC, recent trends in civilian pay, and past literature on setting military pay. We also drew from insights garnered from discussions with SMEs in OSD and in each of the services on pay table reform that we conducted as part of our larger review of the military pay table in support of the 14th QRMC. We assess the proposals in terms of their effects on the pay table, annual pay over the first four YOS for members who experience average promotion times, their effects on pay compression and the differences in pay across ranks, their effects on the recruitment of high-quality enlistees based on past estimates of the relationship between junior enlisted pay and high-quality enlistments, and their effects on retention and personnel costs using RAND's Dynamic Retention Model (DRM).

[1] Additional analysis is being conducted for the 14th QRMC that further investigating the relationship between compensation and military food insecurity.

We begin with a review of the relevant background materials, followed by a description of the proposals. We then present the assessment of the proposals, and conclude with a summary and discussion of findings.

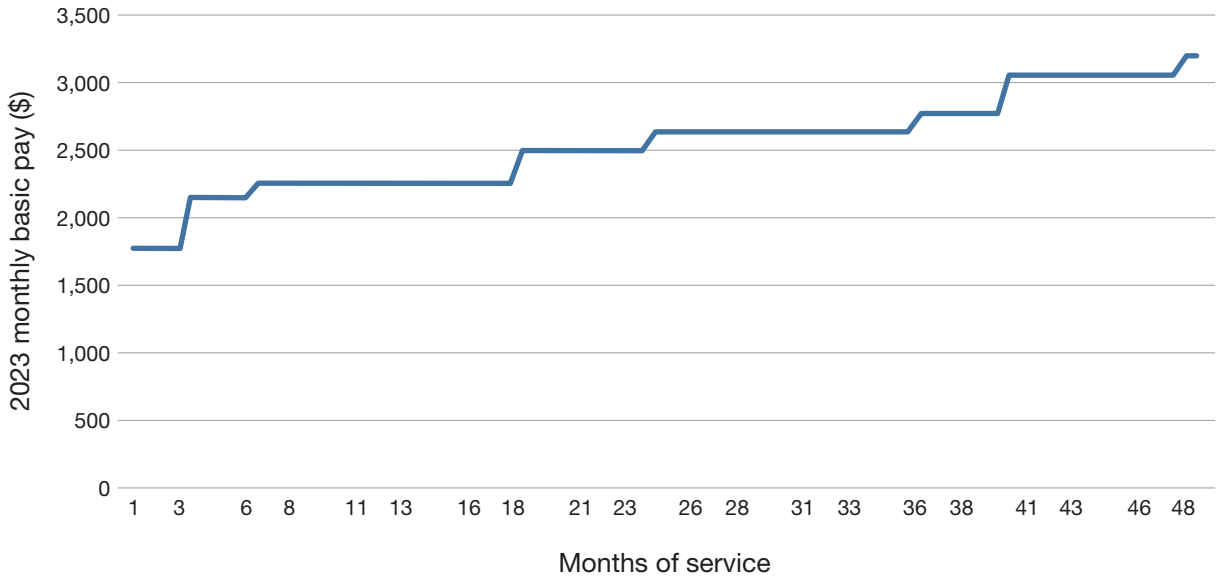
Background

News reports sometimes focus on the annual basic pay of an E-1 to measure military entry pay (Foster, 2022) but pay of first-year service members exceeds the pay of an E-1—$25,326 in pay for first-year members versus $22,428 in annual basic pay for an E-1 with fewer than two YOS in 2023—for three reasons. First, service members who enter with additional qualifications, such as college credit, will enter as an E-2 or E-3. Second, because of rapid promotion during the first year of service, members typically achieve E-3 by the end of their first year, as shown in Table C.1, which shows average months at promotion to E-2 through E-5 using DMDC personnel data for 2013–2018. The result is that service members experience a 27-percent increase in monthly basic pay over the first year, based on the average promotion times across services. Over a four-year period, monthly basic pay increases by 80 percent, as shown in Figure 3.1, owing to both promotion and longevity increases.

Third, service members in their first year also receive allowances for subsistence and for housing, and the tax advantage of receiving these allowances tax free, or, alternatively, they receive food and housing in kind, so their annual pay must also include these elements (or the value of these elements for those who receive in-kind benefits). Over the first year, 2023, RMC—defined as the sum of basic pay, BAH, BAS, and the tax advantage (due to allowances being nontaxable)—equals $53,850 assuming average promotion. Over a four-year period, service members will also receive an annual pay increase each January.

Military pay for junior enlisted members in the first year of service in terms of RMC compares favorably with the federal poverty line (FPL), as shown in Table 3.1. Including potential spouse earnings would make the comparison even more favorable, as would the inclusion of other pays that a service member

FIGURE 3.1
Monthly 2023 Basic Pay over an Early Enlisted Career



NOTE: The figure shows basic pay from the 2023 pay table. Average promotions for all are shown in Table C.1.

TABLE 3.1
The Federal Poverty Line and Tabulations of Family Size of Junior Enlisted Active Duty Members, 2023

FPL			Active Duty Family Size Percentages			
Family Size	FPL	150% of the FPL	E-3	E-2	E-1	E-1, less than four months
1 person	$14,580	$21,870	80.21	89.91	93.92	93.92
2 persons	$19,720	$29,580	13.59	6.65	3.60	3.60
3 persons	$24,860	$37,290	3.86	2.15	1.44	1.44
4 persons	$30,000	$45,000	1.65	0.90	0.77	0.77
5 persons	$35,140	$52,710	0.53	0.28	0.19	0.19
6 persons	$40,280	$60,420	0.17	0.10	0.07	0.07
7 persons	$45,420	$68,130	0.0	0.0	0.0	0.0
8 persons	$50,560	$75,840	0.0	0.0	0.0	0.0
			100	100	100	100

SOURCES: FPL (Department of Health and Human Services, Office of the Secretary, 2023); family size percentages are drawn from the 2023 Greenbook (DoD, OUSD[P&R], 2023).

NOTE: Columns may not sum to 100 percent because of rounding error.

might be eligible for, such as S&I pays. The NDAA for 2022 created the basic needs allowance, a monthly allowance for military households with incomes that fall below 130 percent of the FPL. The limit for qualification was increased to 150 percent of the FPL in the FY 2023 NDAA. As shown in Table 3.1, RMC in 2023 also compares well with the 150 percent of the FPL, except for families of six or more persons. However, as shown on the right-hand side of Table 3.1, less than 0.2 percent of active duty service members in the grades of E-3 or below have families that large. Basic pay over the first year, equal to $25,326, would exceed the FPL for families with two or fewer persons, but exceeds the 150 percent of the FPL for families with one person.

The 13th QRMC concluded in its 2020 report that RMC was more than adequate compared with civilian pay, based on findings at the time that the services were meeting or exceeding their recruiting goals and that average RMC over the first 20 years of an enlisted career was, on average, at the 84th percentile of the earnings of civilians with comparable demographic characteristics (DoD, OPA, 2020b). For junior enlisted members in the first nine YOS, average RMC exceeded the 90th percentile of civilian earnings. As discussed in Chapter 2, we estimate virtually the same percentiles using more updated data for 2021.

Two economic changes have emerged since 2020, when the 13th QRMC reported its results, that are relevant to the setting of basic pay for junior enlisted members. First, inflation has increased since 2021 to levels not seen since the 1970s and early 1980s (Federal Reserve Bank of St. Louis, undated c) and second, the civilian earnings of lower-income earners have risen faster since 2020 than the earnings of higher-income earners creating pay compression in the civilian labor market, as will be shown in Figures 3.2 and C.2.

To put recent inflation in historical perspective, especially as it compares with growth in the ECI and basic pay, Table C.2 shows the annual and cumulative increase in the ECI, basic pay, and the Consumer Price Index for All Urban Consumers (CPI-U) since 2000 (with Figure S.3 showing the cumulative increase).[2] Table C.2 also shows the cumulative increases since 2020. Between 2000 and 2020, basic pay

[2] Section 1009c of Title 37 requires that DoD use the 12-month percentage change in the ECI for the third quarter (Q3) of the calendar year where previous years' values are used to guide its recommendation for the annual basic pay increase. For

increased by 70.7 percent in nominal dollars, while the ECI grew by 67.0 percent and inflation measured by the CPI-U increased by 51.9 percent. Thus, basic pay grew in real dollars over this period by 18.8 percent (70.7 percent – 51.9 percent). The table shows the big jump in inflation, from 1.4 percent in 2021 to 7.6 percent in 2022, and an additional increase of 6.3 percent in 2023 (based on inflation information in January 2023).[3]

Because of recent inflation, the cumulative growth in basic pay between 2000 and 2024 is estimated to be 98.7 percent, or a near doubling of nominal basic pay since 2000, while inflation is estimated to grow by 81.2 percent, for an estimated real growth in basic pay of 17.5 percent (98.7 percent – 81.2 percent). It is important to recognize that these growth figures depend crucially on the choice of the reference year—in this case, 2000. An alternative reference year, such as 2020, as shown in the final three columns of Table C.2, shows that basic pay grew at a slower rate than inflation since 2020, 16.4 percent versus 19.3 percent, respectively.[4]

Figure C.2 shows that lower income civilian workers have had the fastest pay growth since the outbreak of the COVID-19 pandemic in 2020. The figure shows median real civilian weekly earnings of 18- to 30-year-old workers by quarter. To illustrate how earnings have grown relative to the beginning of the pandemic, the figure shows earnings in each quarter relative to earnings in the first quarter (Q1) of 2020. Furthermore, we show comparisons for civilians in the tenth percentile, 50th percentile, and 90th percentile of the civilian earnings distribution. Earnings growth relative to 2020 was roughly the same across the three groups between 2017 and 2020. Beginning in 2020, earnings growth for civilians in the tenth percentile was greater than for the other two groups; those in the 90th percentile have the slowest growth of the three groups. This recent shift in the labor market has been noted by labor economists. Autor, Dube, and McGrew (2023) present evidence that shows this faster wage growth of lower-income workers has been accompanied by a tight labor market for less-skilled workers, resulting in higher turnover, more frequent job changes, and, in turn, higher wages.

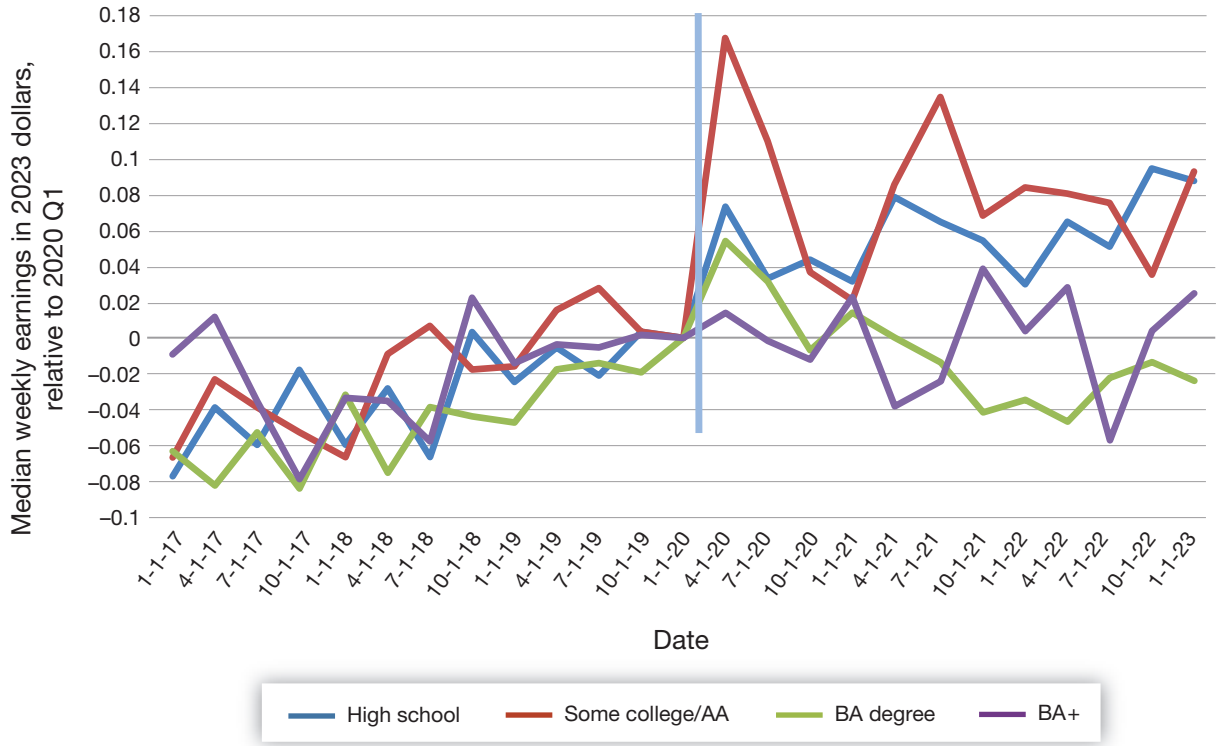
This recent labor market trend can also be seen by educational attainment where the real median earnings of high school graduates and those with some college between the ages of 18 and 30 have grown faster since 2020 than the earnings of college graduates (see Figure 3.2). Specifically, real median earnings have grown by 8.7 percent for high school graduates since 2020 and by 9.2 percent for those with some college, as shown in Figure 3.2. The changes for those with a BA degree and with more than a BA degree were –1.4 percent and 2.4 percent, respectively. The result has been a reduction in the wage premium enjoyed by those with a college degree. An open question is whether this shift is a temporary or permanent change in the labor market opportunities of high school graduates and those with some college, a key demographic from which the military recruits and retains junior enlisted personnel.

example, the ECI that guided the 2023 pay raise is the percentage change for Q3 2021 relative to Q3 2020. The statute also allows the President to specify an alternative pay adjustment informed by recruiting and retention outcomes. The values of ECI shown in Table C.2 are the values that guided the pay raise in a given year. For example, the ECI that guided the 4.6 percent basic pay increase in January 2023 was 4.6 percent, the percentage for Q3 2021.

[3] White House budget estimates use a 2.8 percent inflation rate for 2024, as shown in the final row of the table, and the table shows the proposed 5.2 percent across-the-board basic pay raise for 2024; White House, Office of Management and Budget, 2023.

[4] The arbitrary choice of reference year is a well-known problem with using indices. The choice depends on the intent. If the focus is on recent changes, ignoring the historical context, then using a more recent reference year makes sense, but if the historical context is important, then having information based on an earlier reference year makes sense.

FIGURE 3.2
Indexed Median Real Weekly Earnings of Civilian Workers, Ages 18–30, by Educational Attainment



SOURCE: Authors' computations using CPS data from the BLS.
NOTE: AA = associate of arts; BA = bachelor of arts.

Description of the Proposals

Table 3.2 lists the two congressional proposals, plus the four additional proposals we developed to raise junior enlisted basic pay. Tables C.4–C.10 show what the 2023 basic pay table would look like by grade and YOS for those with fewer than ten YOS for each proposal. For comparison, Table C.3 shows the current 2023 basic pay table. Later, in Figure 3.4, we show graphically how the proposals would change pay in the early career and change the structure of the pay table. In this section we describe how we developed Proposals 3–6. Later in this chapter we present our analysis of the proposals.

Proposal 3

To develop Proposal 3, we considered the increases in real median weekly earnings of civilians since 2020, which is shown in Figure 3.2 for high school graduates and civilians with some college, together with the real change in basic pay since 2020, which is shown in the last two columns of Table A.2. We focus on 2020 because the 13th QRMC report, published in 2020, deemed the level of enlisted pay adequate at that point in time, and we focus on high school graduates and those with some college since at least 90 percent of enlisted recruits have at least a high school degree. Together, these tabulations indicate that basic pay would need to increase by about 12 percent to restore the real value of basic pay relative to the civilian pay of high school graduates and those with some college since 2020. Consequently, Proposal 3 would increase E-1 to E-4 basic pay across the board by 12 percent.

TABLE 3.2
Proposals to Increase Junior Enlisted Basic Pay

Proposal Name	Motivation	Description
1. Proposal of Representative Mike Garcia	Reflect H.R. 2591	Creates a minimum $15/hour or $31,200 for E-1 < 4 months; to E-4 to 2 years
2. House Appropriations Committee (HAC) proposal	Reflect Section 8138 of HAC FY 2024 defense bill	Target increases to FY 2023 basic pay for E-1 > 4 months; to E-6 < 2 years (see Table C.5).
3. Junior civilian pay catch-up proposal	Reflect recent trends in civilian opportunities for junior enlisted members	Increase E-1 to E-4 basic pay by 12 percent
4a. Recruiting catch-up proposal (7%)	Increase high-quality enlistments to meet FY 2023 goals	Use estimates of high-quality enlistment pay elasticities to infer pay raise needed to increase enlistments, increase E-1 to E-4 pay by 7%
4b. Recruiting catch-up proposal (15%)	Increase high-quality enlistments to meet FY 2024 goals	Use estimates of high-quality enlistment pay elasticities to infer pay raise needed to increase enlistments, increase E-1 to E-4 pay by 15%
5. AVF catch-up proposal	Restore junior enlisted pay to historic structure and increase equity relative to career enlisted	Increase E-1 to E-4 basic pay to real 1973 levels relative to E-5 pay
6. Boot camp pay catch-up proposal	Restore pay for E-1s in boot camp	Raise E-1 < 4 months basic pay to E-1 < 2 years level

SOURCE: H.R. 2591, 2023.

Because a 12-percent pay increase targeted to E-1 to E-4 would create a pay inversion relative to the basic pay of an E-5—meaning that pay of some E-5s would be less than the pay of a lower-ranked E-4—we also increased E-5 pay, using the following algorithm. E-5 basic pay for a given YOS cell under this proposal is set to the greater of (1) the midpoint of the increased E-4 basic pay and E-6 basic pay under the baseline 2023 pay table, or (2) the baseline E-5 basic pay in the 2023 pay table.

Proposal 4

For Proposal 4 we estimated the extent to which military pay must increase relative to civilian pay to increase high-quality enlistments sufficiently to meet the FY 2023 enlistment requirements in the Department of the Air Force, Army, and Navy, the three services reporting that they will be missing their enlistment goals.[5] In testimony to the House Armed Services Subcommittee on Readiness on April 19, 2023, military department leaders from the Army, Navy, and Department of the Air Force indicated that these services would miss their active enlisted accession missions by 10,000, 6,000, and 3,400 recruits, respectively (U.S. House of Representatives, Armed Services Committee, 2023). These figures represent a shortfall of 15 percent across the three services given their FY 2023 accession missions. Tables C.4–C.10 summarize estimates of the responsiveness of high-quality enlistments to changes in military pay relative to civilian pay—what economists call a pay elasticity—from past studies of enlistment supply using data since the early 1990s. The average estimate

[5] The definition of a high-quality recruit is one with Tier 1 educational credentials; this is primarily an individual with a high school diploma and who scores at or above the 50th percentile on the AFQT.

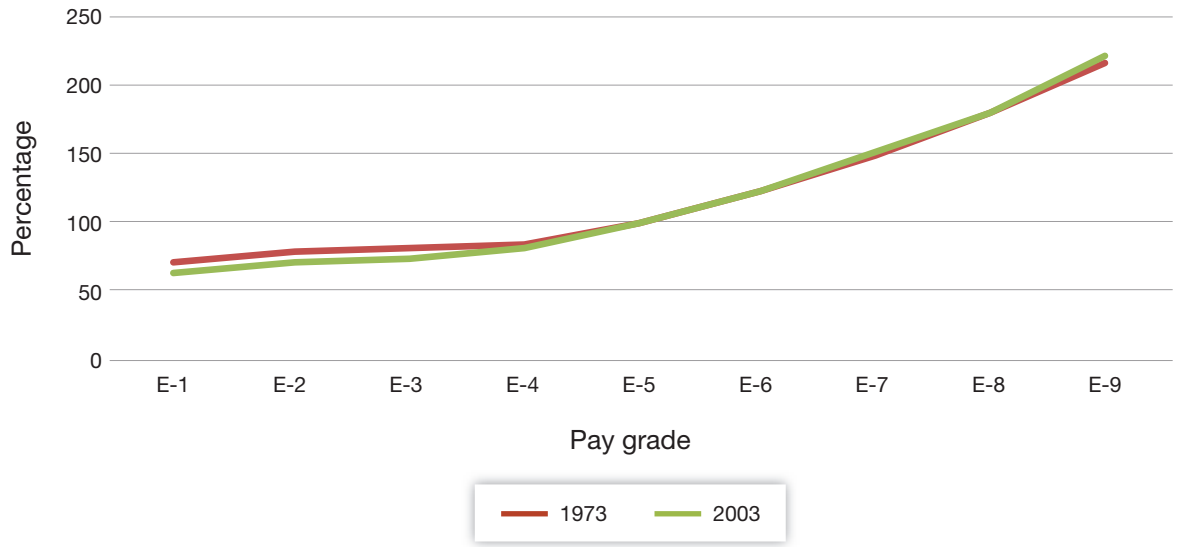
across studies is 0.69, implying that high-quality enlistments are estimated to increase by 0.69 percent if military pay relative to civilian pay were increased by 1 percent, all else being equal.

Assuming that the 15 percent shortfall for all accessions would also apply to high-quality enlistments in these services, the 0.69 average estimate implies that a relative pay increase of 22 percent (15% 0.69) would be required to address the recruiting shortfall with military pay. However, the services are pursuing an array of initiatives and policies to address their recruiting shortfalls, including expanding the use of enlistment bonuses, increasing advertising, adding recruiters, and increasing enlistment eligibility. Consequently, we considered two alternative smaller changes in relative military pay: 15-percent (Proposal 4b) and 7-percent (Proposal 4a) across-the-board increases in E-1 to E-4 basic pay. Because the 15-percent increase targeted to E-1 to E-4 would create a pay inversion with respect to E-5, we used the same algorithm as we used in Proposal 3 to raise E-5, as needed. We note that although these proposals consider using pay to address recruiting shortfalls, we show later in the chapter that improvements in recruiting can be achieved more cost-effectively with bonuses and recruiters, and past research, as noted in Chapter 2, shows that resources other than pay, including advertising and educational benefits, are more cost-effective resources.

Proposals 5 and 6

Proposals 5 and 6 would restore reductions in junior enlisted pay relative to other military personnel that have occurred since the beginning of the AVF in 1973, as shown in Figure 3.3. The figure shows enlisted basic pay at promotion to each grade relative to pay at promotion to E-5 under the current FY 2023 pay table and the pay table applicable at the start of the AVF in 1973.[6] Basic pay at promotion to E-5 is normalized to 100 percent for both the 2023 and 1973 pay tables. Pay at E-1 was 70 percent of pay at promotion to

FIGURE 3.3
Basic Pay Relative to Pay of an E-5 (Percentage)



SOURCE: Authors' calculations based on October 1972 and January 2023 basic pay tables and average times to promotion in Table C.1.
NOTE: The figure shows basic pay at promotion to each grade relative to E-5 basic pay at promotion. Basic pay at E-1 is entry pay.

[6] Military conscription ended July 1, 1973, although announcement of the creation of the AVF occurred in January 1973. The basic pay table relevant at the start of the AVF was the October 1, 1972, pay table. Service members received their next basic pay increases on October 1, 1973.

E-5 under the 1973 pay table but is 63 percent under the current pay table. The differences between the pay tables narrow at E-4, equal to 84 and 82 percent of E-5 pay at promotion, respectively, under the 1973 versus the current pay table. Proposal 5 would increase E-1 to E-4 basic pay in the 2023 pay table to restore its 1973 relationship to E-5 pay.

Why is basic pay lower under the current pay table for E-1s to E-4s than under the 1973 table, as shown in Figure 3.3? The reason is that junior enlisted members received smaller pay raises than other enlisted members in 1981, 1988, 2000–2004, and 2007. For example, in October 1981, E-1s to E-4s received a pay raise less than the 16.5-percent raise received by E-5s and above, though their raises were still quite large by historical standards.[7] In 2000–2004 and again in 2007, all service members received a pay raise, but Congress targeted additional pay raises to midgrade and, in some cases, senior members. A policy action that would raise junior enlisted pay to the 1973 structure would counteract these past actions, even though they were presumably seen as desirable at the time. A year other than 1973 could be chosen, and a priori, there is no clear reason to necessarily prefer 1973 to an alternative year.

Proposal 6 would eliminate the four months of service distinction for E-1s. Currently, enlisted members in the grade of E-1 with fewer than four months of service, typically while they are in basic training, or boot camp, receive lower pay than E-1s with four or more months of service, as shown in Table C.2. This distinction in E-1 pay existed until November 1971, when it was dropped. It was later restored in 1985. By eliminating this distinction, E-1s with fewer than four months would receive the same pay as E-1s with four or more months of service under the current pay table.

Assessment of the Proposals

Effects on Annual Basic Pay

The proposals differ in terms of the magnitude and time pattern of effects on annual basic pay over the first four YOS, as shown in Figure 3.4, assuming average promotion times to each grade. Figure 3.4 shows the levels of annual basic pay, and Table 3.3 shows the percentage changes. The percentage increase in basic pay across YOS is the same under the civilian pay catch-up proposal (Proposal 3)—equal to 12 percent—as well as under the recruiting catch-up proposals (Proposals 4a and 4b), except for the fourth year of service.[8] The remaining proposals, including the two congressional proposals, front-load the pay increases to the beginning of the career. The largest percentage increase is in the first year of service for these other proposals—except for the HAC proposal (Proposal 2), where the largest increase is in the second year.[9] The HAC proposal would increase basic pay the most over the first four years, followed by the recruiting catch-up proposal (Proposal 4), assuming a 15-percent pay increase. The proposal of Representative Mike Garcia (Proposal 1) would increase basic pay the most in the first year. The bootcamp catch-up proposal (Proposal 6) would increase pay the least, with an increase in the first year of 1.7 percent.

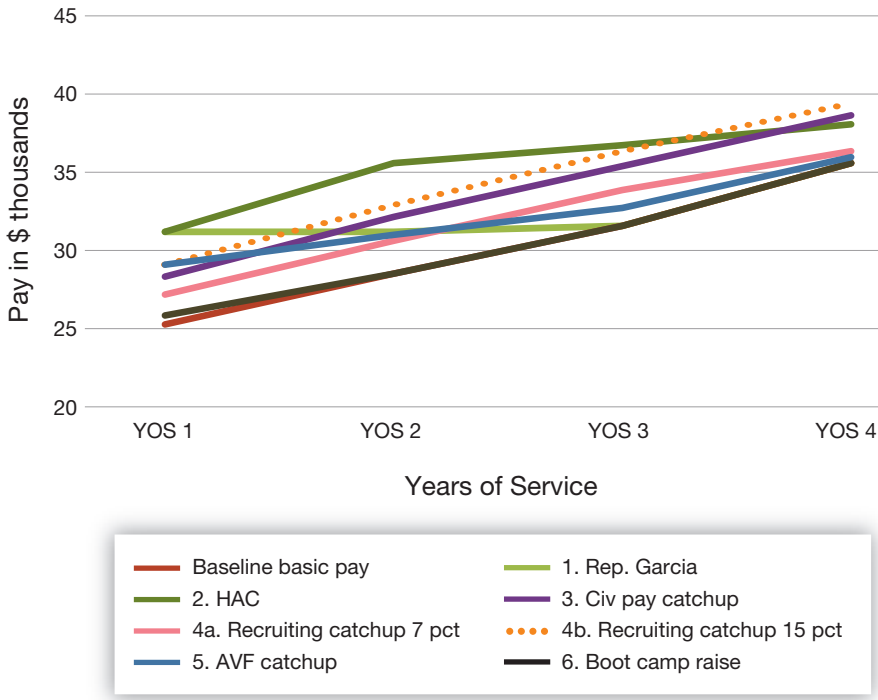
[7] That year, E-1s received a 10-percent basic pay raise, E-2s and E-3s received a 10.7-percent raise, and E-4s receive a 13.0-percent raise.

[8] The fourth year of service differs because service members only spend a partial year as an E-4 in the fourth year of service and a partial year as an E-5. E-5s do not receive the targeted junior enlisted basic pay increase, so the pay raise in the fourth year of service is less than the earlier year of service for these proposals.

[9] The largest increase occurs in the second year of service rather than the first year of service under the HAC proposal because this proposal does not increase the pay of an E-1 with fewer than four months of service.

FIGURE 3.4

Annual Basic Pay in the First Four Years of Service Under Proposals



SOURCE: Authors' calculations based on average promotion times to each grade.

TABLE 3.3

Annual Basic Pay in the First Four Years of Service Under the Current Pay Table, and Percentage Change in Annual Basic Pay Under Each Proposal

	Years of Service			
Annual Basic Pay	**1**	**2**	**3**	**4**
Annual basic pay, 2023	$25,326.00	$28,580.40	$31,579.20	$35,538.00
	Percentage Change in 2023 Annual Basic Pay			
1. Proposal of Representative Mike Garcia	23.2	9.2	0.0	0.0
2. HAC proposal	22.9	24.1	16.3	6.9
3. Junior civilian pay catch-up proposal	12.0	12.0	12.0	8.5
4a. Recruiting catch-up proposal (7%)	7.0	7.0	7.0	2.2
4b. Recruiting catch-up proposal (15%)	15.0	15.0	15.0	10.4
5. AVF catch-up proposal	14.4	8.2	3.3	1.1
6. Boot camp pay catch-up proposal	1.7	0.0	0.0	0.0

SOURCE: Authors' calculations based on average promotion times to each grade.

NOTE: Levels of basic pay for the first four years of service are shown in Table C.12.

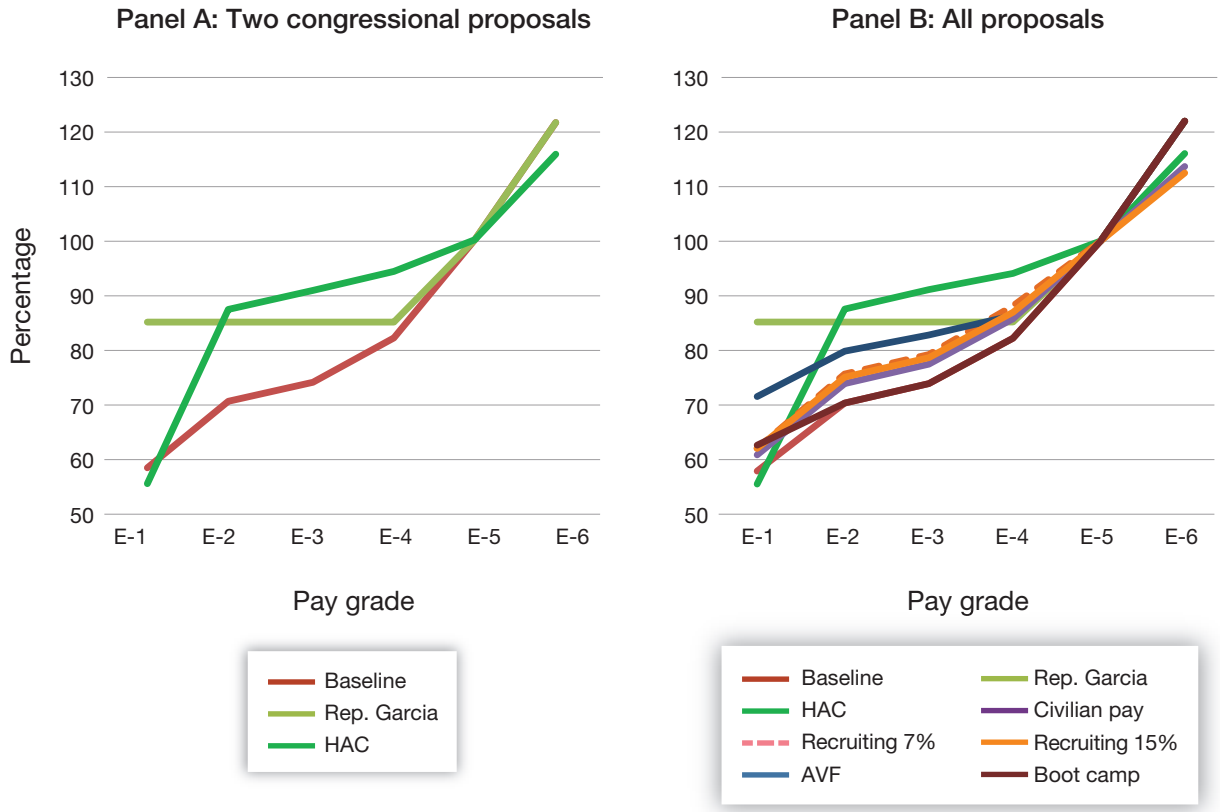
Effects on Structure of Pay Across Grades

Figure 3.5 shows how all six of the proposals compress the structure of basic pay across grades, with the two congressional proposals compressing the pay structure the most. Similar to Figure 3.3, Figure 3.5 shows monthly basic pay at promotion to each grade relative to basic pay of an E-5—consequently, E-5 pay is benchmarked at 100 percent. Panel A highlights the two congressional proposals, while Panel B shows all six proposals, including the two versions of Proposal 4. The pay structure is compressed when the pay raise associated with promotion to a higher grade is reduced, thereby reducing the financial reward to promotion.

The pay structure is entirely flat until the grade of E-4 under Representative Garcia's proposal (Proposal 1), implying that there is no financial reward associated with promotion to these early grades. The HAC proposal (Proposal 2) creates a large jump in pay between E-1 and E-2 because the proposal did not increase the pay of E-1s with fewer than four months of service. Relative to the baseline current system, the HAC proposal flattens or compresses the increases in pay associated with promotion after E-2, including promotion to E-6. As shown in Panel B of Figure 3.5, the remaining proposals (Proposals 3–6) also flatten the pay increases associated with promotions to the grades E-2 to E-5, but to a less extent than either of the congressional proposals. Among Proposals 3–6, the bootcamp catch-up proposal (Proposal 6) compresses the pay structure the least, as it only affects the pay increase associated with promotion to E-2.

FIGURE 3.5

Basic Pay Relative to Pay of an E-5 Under Alternative Proposals (Percentage)



NOTE: The figure shows basic pay at promotion to each grade relative to E-5 basic pay at promotion. Basic pay at E-1 is entry pay.

Pay compression matters because it can affect performance incentives. Promotions in the military are the primary means by which the services financially reward superior performance, especially beginning with promotion to E-5, which is the first truly competitive promotion for enlisted personnel. Promotions in the early ranks of E-1 to E-4 tend to be automatic, based on time in grade and time in service and, for promotion to E-4, based on completion of training. Nonetheless, junior enlisted members must exhibit discipline and perform at a requisite level of proficiency associated with their grades. By eliminating the pay bumps associated with promotion to E-2, E-3, and E-4, the proposal of Representative Mike Garcia significantly weakens the incentives to perform above the minimum level required to remain in the military, though the importance of performance incentives in the early enlisted grades is an empirical question. The other proposals reduce these incentives to varying, lesser, extents.

Compression of pay in the early grades relative to the middle grades and senior grades can affect the incentives of the most talented and most qualified service members to remain in the military and perform at levels that result in faster promotion. That is, compressing pay in the early ranks reduces the relative incentives associated with promotion to E-5 and beyond, and therefore retention and performance incentives. Retention and promotion of the most qualified service members is important in a closed personnel system like the military's, where there is little lateral entry. To ensure that the most senior-ranked personnel are the best and the brightest, the pay structure must be set so that these personnel are incentivized to stay in the military and perform well when they are junior members so they are promoted to the more senior ranks. Research shows that to sustain performance incentives, the pay raises associated with promotion should increase more with each subsequent promotion, directly the opposite of pay compression (Asch and Warner 1994; Lazear and Rosen 1981).

Initial Results on Military Cash Compensation and Food Insecurity

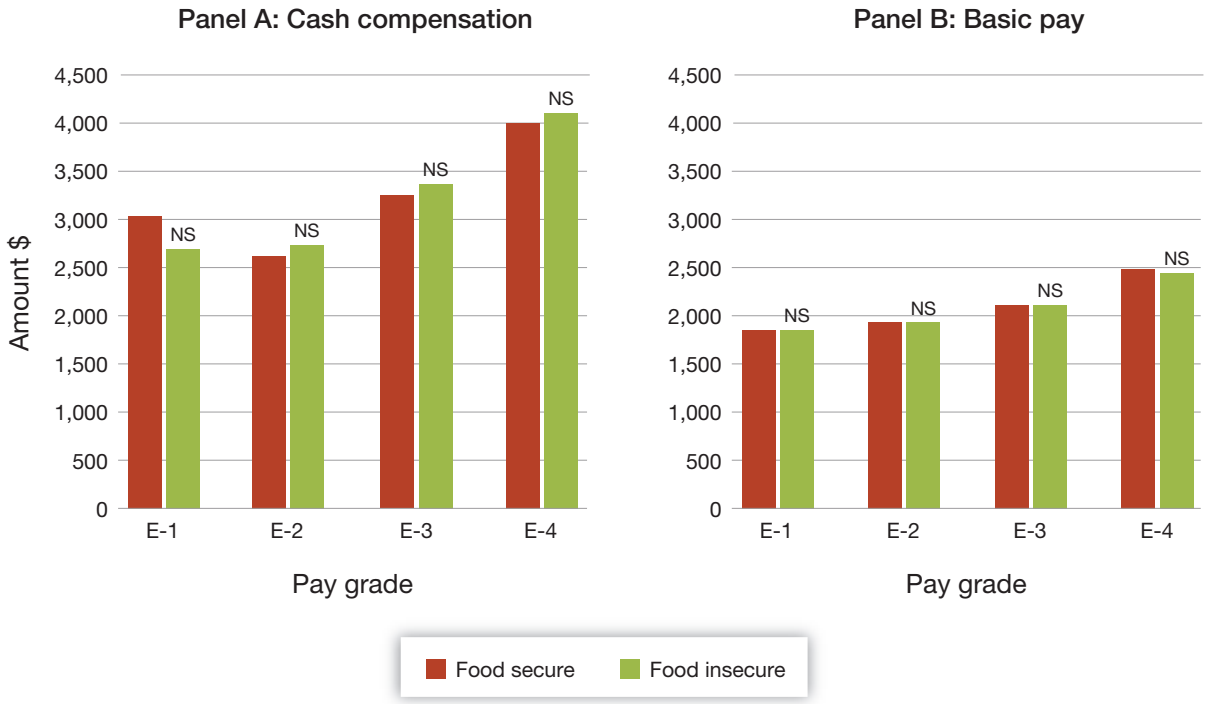
Before showing results on the estimated recruiting, retention, and cost effects of the proposals, we first provide some initial analysis on the extent to which raising basic pay for junior enlisted personnel would improve food security. One of the motivations for raising junior enlisted pay is to address the higher rate of food insecurity among these personnel.

Initial evidence using 2018 SOFS-A data, merged with DMDC pay records for these service members, indicates that average pay for food insecure junior enlisted members is not statistically different from the average pay of food secure service members at the 5 percent level, as shown in Figure 3.6. Research on civilians indicates that those with higher income are less likely to be food insecure, but, as noted by Gundersen and Zilliak in their review of the literature,

> Households with lower incomes are consistently found to be more likely to be food insecure. The importance of current income, however, is diminished once assets are considered (e.g., lower financial management skills . . . and lower education levels), physical assets (e.g., renting rather than owning a home), and financial assets (e.g., limited savings, lack of access to credit . . . , sharp changes in asset levels). (2018, pp. 122–123)

More research is needed to understand the relationship between food insecurity and pay in the military and the role of food assistance, financial literacy, savings behavior, and other factors in mitigating food insecurity. While raising junior enlisted pay could reduce food insecurity among junior personnel, the tabulations shown in Figure 3.6 suggests little relationship between pay and food insecurity among these personnel. Additional analysis is being conducted for the 14th QRMC to further investigate the relationship between military pay, financial readiness, and food insecurity.

FIGURE 3.6
Average Monthly Cash Compensation and Basic Pay for E-1 through E-4, by Food Insecurity Status, November 2018



NOTE: Tabulations are based on merging survey responses from 2018 SOFS-A data on food insecurity with November 2018 DMDC pay records of the respondents. NS = not statistically significant (between food secure and food insecure average pay at the 5-percent level).

Effects on Recruiting Outcomes

While the proposals compress the pay structure and reduce performance incentives among enlisted members, as shown in Figure 3.5, raising junior enlisted pay increases the pool of better-qualified applicants by increasing military pay relative to the civilian opportunities available to these applicants in the external market. Past studies estimate a positive relationship between relative military pay and the supply of high-quality enlistments, as summarized in Table C.11. As noted earlier, the average estimated pay elasticity is 0.69 across studies. We applied this average estimate to the percentage change in the discounted present value (DPV) of basic pay under each alternative to estimate the implied percentage change in high-quality enlistments under each proposal. The results are summarized in Table 3.4. All the proposals would increase high-quality enlistments, given the elasticity estimate we use, but to varying degrees, reflecting the extent of the increase in basic pay by YOS.[10]

While all proposals would expand enlistment supply, as noted in Chapter 2, research shows that increasing military pay is the least cost-effective way to improve recruiting relative to other policies including bonuses, recruiters, advertising, and educational benefits (Asch et al., 2010; Simon and Warner, 2007; Warner, Simon, and Payne, 2003; Warner and Simon, 2004). Increasing military pay relative to civilian pay is an expensive approach to addressing recruiting problems because unlike bonuses, pay raises are permanent and factor into future pay raises; they also factor into other benefits, such as retired pay. Increasing pay to solve recruiting problems only begins to make sense when the services are also experiencing widespread retention problems, as was the case in the late 1990s. But, as noted earlier, there is no evidence of widespread retention problems

[10] Proposals that front-load the basic pay increase will increase the DPV more than increases that are evenly distributed across YOS.

TABLE 3.4
Summary of the Effects of Junior Enlisted Basic Pay Proposals

Proposal	Recruiting	Retention	Compression	Cost	Food Security
1. Representative Garcia	▲	▲	●	▲	✖
2. House Armed Services Committee proposal	●	●	●	●	✖
3. Junior civilian pay catch-up proposal	●	●	●	●	✖
4a. Recruiting catch-up proposal (7%)	▲	▲	●	▲	✖
4b. Recruiting catch-up proposal (15%)	●	●	●	●	✖
5. All-volunteer force catch-up proposal	▲	▲	▲	▲	✖
6. Boot camp pay catch-up proposal	▲	▲	●	●	✖

KEY: ● = favorable ▲ = acceptable ● = undesirable ✖ = not applicable.

currently. We illustrate the relatively higher cost of addressing recruiting challenges through raising pay in the following discussion on costs.

Effects on Retention and Personnel Costs

We estimate the steady state retention and cost effects of the six proposals using RAND's DRM estimates for enlisted personnel in each service produced for the 13th QRMC (Asch, Mattock, and Tong, 2020).[11] We show results for Army enlisted personnel in this section, though results for the other services are qualitatively similar and are shown in Appendix C.

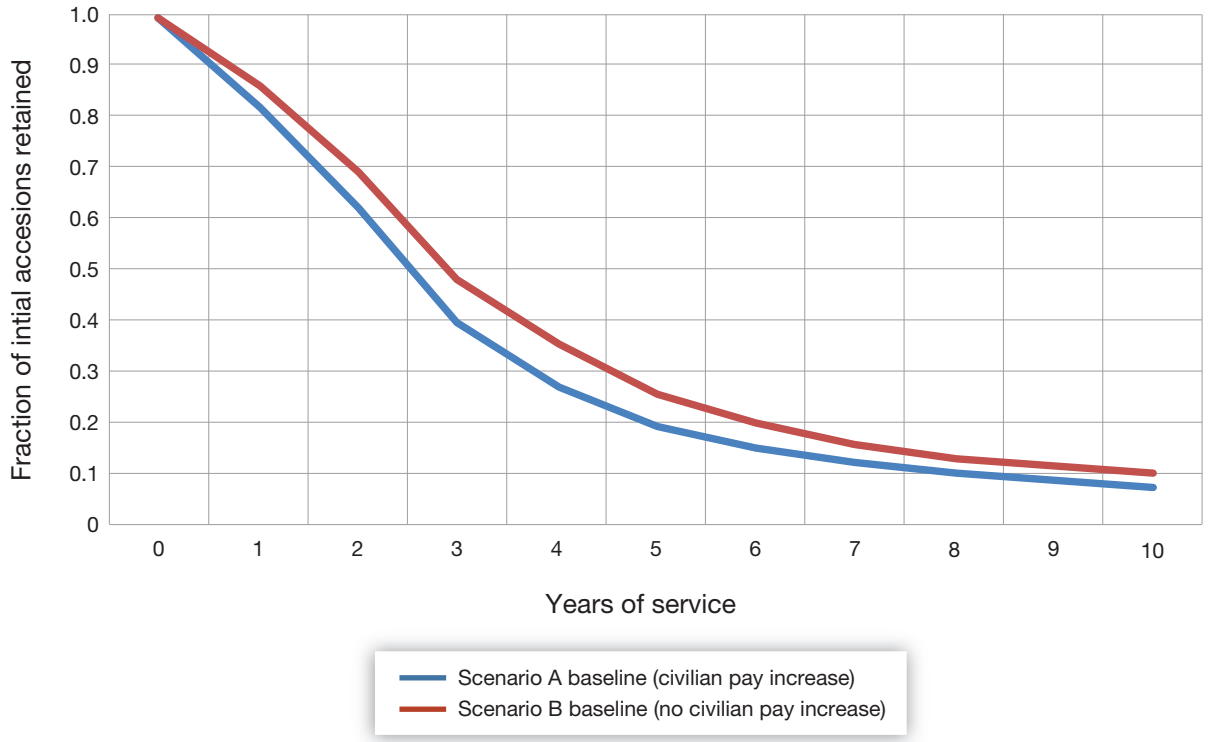
We estimate retention and cost effects for each proposal under two alternative scenarios. Scenario A assumes that the increases in civilian earnings since 2020 shown in Figure 3.2 are permanent and can adversely affect retention in the long run. An advantage of considering this scenario is that a motivation for increasing junior enlisted pay is to offset potential adverse effects of recent changes in the civilian economy. The disadvantages of this scenario are that the civilian earnings changes observed since 2020 may be temporary and that retention in the services has been strong, which obviates the need for the pay increase. We therefore also consider results under Scenario B, in which we assume the changes in Figure 3.2 are temporary so that the increases in civilian earnings since 2020 do not affect retention in the steady state.

To illustrate the differences in the two scenarios, Figure 3.7 shows predicted steady state Army enlisted retention—the portion of the entry cohort remaining to each year of service—over the first ten YOS under the current (baseline) FY 2023 pay table under each scenario. Retention is lower under Scenario A because of the assumed (permanent) increase in civilian pay opportunities that service members consider when making their retention decisions in the model. As shown in Table 3.5, predicted man-years per accession are 4.6 under Scenario A, which is 13.7 percent lower than predicted man-years under Scenario B (equal to 5.3 years).

[11] The modeling does not account for second-order effects on retention and cost. For example, an increase in retention owing to a basic pay increase could slow promotion speed and expected future pay, thereby creating a second-order effect that mutes retention. Similarly, increased retention means that a smaller portion of the force will be trainees and, presumably, trainers. Thus, improved retention should also reduce end-strength requirements as a second-order effect.

FIGURE 3.7

Predicted Steady State Cumulative Fraction of Entry Cohort Retained Through the Tenth Year of Service, Army Enlisted Personnel, Under Scenarios A and B



SOURCE: Authors' calculations using RAND's DRM.

TABLE 3.5

Predicted Steady State Man-Years Per Accession, and Cost per Member, Under the Current Baseline Pay Table, Army Enlisted Personnel, Under Scenarios A and B

Scenario	Retention: Man-Years per Accession	Cost per Service Member (in 2023 Dollars)
Scenario A baseline (assumes change in civilian pay is permanent)	4.6	$74,700
Scenario B baseline (assumes no change in civilian pay relative to 2020)	5.3	$76,900
Percentage change in baseline A relative to B	–13.7%	–2.8%

SOURCE: Authors' calculations using RAND's DRM.

NOTE: To compute cost per service member, personnel costs include basic pay costs, BAH, BAS, and legacy military retirement accrual costs.

Costs per soldier are 2.8 percent lower under Scenario A, $74,700 compared with $76,900 in 2023 dollars, because the lower retention means the force is a more junior one, so the basic pay bill and bill associated with the retirement accrual charge for the Army enlisted force is lower. Cost per soldier includes basic pay, BAH, BAS, and retirement accrual costs.

While we produce estimates under both scenarios, we find that the results are qualitatively similar for both, with scenario A increasing cost per person by slightly more due to the changes being permanent. Consequently, we show results for Scenario B in Appendix C.

We find that the recruiting catch-up proposal (15 percent) and junior civilian pay catch-up proposal are predicted to produce the largest increases in steady state retention measured in terms of man-years per accession, 35.3 percent and 27.6 percent, respectively, as well as the largest increases in cost per service member relative to the baseline. Table 3.6 shows the percentage change in retention and in cost relative to the baseline under Scenario A, shown in Table 3.5. Table C.13 shows results under Scenario B. The smallest predicted changes are under the boot camp pay catch-up proposals. Predicted retention is estimated to increase by 0.4 percent while cost per soldier in 2023 dollars is estimated to increase by 0.3 percent. In contrast, the retention and cost-per-member effects of the recruiting catch-up proposal (15 percent) are estimated to be 35.3 percent and 13.3 percent, respectively.

To estimate the incremental cost associated with an increase in retention or marginal cost of raising pay under each proposal, we take the ratio of percentage increase in cost per service member over the percentage increase in retention. The middle column of Table 3.5 shows the results.[12] The lower the ratio, the lower the marginal cost estimate and the more efficient the proposal is in terms of producing more retention for a given increase in cost per service member.

We find that the most efficient proposals are the two recruiting catch-up proposals (Proposals 4a and 4b) and the civilian pay catch-up proposal (Proposal 3), with marginal cost estimates of 0.38, 0.47, and 0.39, respectively for Scenario A, as shown in Table 3.7. The next most efficient are the HAC proposal (Proposal 2) and the AVF catch-up proposal (Proposal 5), with estimates of 0.53 and 0.54, respectively. The least efficient in terms of our marginal cost estimates are the proposal of Representative Mike Garcia (Proposal 1) and the boot camp pay catch-up proposal (Proposal 6), with estimates of 0.80 and 0.82, respectively. The results for Scenario B in Table C.13 show the same ordering of the proposals in terms of marginal cost estimates, though the magnitudes of the estimates differ from Scenario A.

TABLE 3.6

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Proposals, Army Enlisted Personnel, Under Scenario A

Proposal	Percentage Change in Retention Relative to Baseline	Percentage Change in Cost per Service Member (in 2023 Dollars)	Marginal Cost = Ratio of Percentage Change in Cost over Percentage Change in Retention	Annual cost, Army ($Billions per Year)	Annual cost, DoD ($Billions per Year)
1. Proposal of Representative Mike Garcia	3.9	3.1	0.80	$0.617	$1.684
2. HAC proposal	19.6	10.4	0.53	$1.420	$3.869
3. Junior civilian pay catch-up proposal	27.6	10.9	0.39	$1.036	$2.954
4a. Recruiting catch-up proposal (7%)	8.1	3.8	0.47	$0.516	$1.463
4b. Recruiting catch-up proposal (15%)	35.3	13.3	0.38	$1.297	$3.709
5. AVF catch-up proposal	6.1	3.3	0.54	$0.583	$1.712
6. Boot camp pay catch-up proposal	0.4	0.3	0.82	$0.018	$0.046

SOURCE: Authors' calculations using RAND's DRM.

NOTES: Retention is measured in terms of steady state man-years per accession, while personnel costs per service member include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Annual costs in the last two columns include basic pay cost and retirement accrual cost only. Results shown are relative to the baseline for Scenario A shown. Scenario A assumes permanent change in civilian pay, as shown in Figure 3.2. Scenario A results for all services are shown in Table C.15. Scenario B results, assuming no change in civilian pay, are shown in Table C.14.

[12] The traditional metric of marginal cost is not typically measured in percentage terms but in absolute change—that is, the ratio of the change in total cost over the change in retention. The metric we use changes the scale of the marginal cost estimates.

While the recruiting catch-up proposal, assuming a 15-percent pay increase, is the most efficient proposal for the Army, it is also one of the most expensive in terms of cost. Table 3.6 also shows the cost to the Army and to DoD of these proposals, in terms of the increase in basic pay cost and retirement accrual costs under Scenario A for the Army. For both the Army and DoD as a whole, the HAC proposal is more expensive than the 15-percent recruiting catch-up proposal and is the most expensive of the proposals. The boot camp proposal is the least costly, but it is also among the least efficient in terms of retention.

As noted above in the context of the estimated effects of the proposals on high-quality enlistments, research shows that enlistment bonuses and recruiters are more cost-effective approaches to increasing enlistments than raising pay. We illustrate this result in Table 3.7 for the Army. Specifically, we draw on past research to estimate the cost to the Army of achieving the same increase in high-quality enlistments under each proposal as shown in the final column of Table 3.7 using enlistment bonuses or recruiters rather than pay. As shown in Table C.11, the average estimated elasticity of high-quality enlistments with respect to enlistment bonuses is 0.077; it is 0.503 for recruiters. That is, a doubling of bonuses (or a 100-percent increase) is estimated to increase high-quality enlistments by 7.7 percent while a 10-percent increase in recruiters is estimated to increase high-quality enlistments by 5.03 percent. Using tabulations and results from Ward et al. (2023), we assume the average enlistment bonus across all high-quality recruits is $5,904, with 36 percent of high-quality enlistments eligible for bonuses, and we assume the Army recruiter force is 8,700, with an average cost to the Army of a recruiter equal to $115,830. We also assume the Army has a gross enlistment contract mission of 70,000 recruits, with 59 percent of them being 41,300 high-quality contracts. With these assumed inputs, we computed the additional enlistment bonuses required to produce the same enlistment effect as each proposal and the additional numbers of recruiters required, and then computed the additional cost associated with those added bonuses and recruiters. The results are shown in Table 3.8.

The estimates imply that the cost of producing the same enlistment effect as pay under each proposal is less with enlistment bonuses, and even lower with an increased number of recruiters. For example, the highest-cost proposal to the Army using pay is the HAC proposal, with an estimated cost to the Army of $617 million. This proposal is estimated to increase Army high-quality enlistments by 4,956. To achieve this same increase, bonuses would need to increase by 156.5 percent or, alternatively, the number of recruiters would need to increase by 2,076, given our assumptions about numbers of high-quality contracts, the

TABLE 3.7

Cost to the Army of Increasing Enlistment Bonuses or the Number of Recruiters to Produce the Same Enlistment Effect as Each Proposal to Raise Junior Enlisted Members' Basic Pay

Proposal	Estimated Percentage Change in High-Quality Enlistments Based on Past Studies	Army Basic Pay plus Retirement Accrual Cost Increase ($Billions per Year)	Cost to Army of Increasing Enlistment Bonuses ($Billions per Year)	Cost to Army of Increasing Recruiters ($Billions per Year)
1. Proposal of Representative Mike Garcia	5.5	$0.617	$0.184	$0.110
2. HAC proposal	12.0	$1.420	$0.427	$0.240
3. Junior civilian pay catch-up proposal	7.7	$1.036	$0.264	$0.154
4a. Recruiting catch-up proposal (7%)	4.0	$0.516	$0.132	$0.080
4b. Recruiting catch-up proposal (15%)	9.5	$1.297	$0.331	$0.190
5. AVF catch-up proposal	4.6	$0.583	$0.153	$0.092
6. Boot camp pay catch-up proposal	0.3	$0.018	$0.010	$0.006

average size of bonuses, and the recruiter force. The cost of these additional bonuses would be $427 million, less than the $617 cost of pay to the Army, while the cost of the additional recruiters would be lower, $240 million. We find similar results for the other proposals; of the three approaches, recruiters are the most cost-effective approach to increasing high-quality enlistments under each proposal, while pay is the least cost-effective approach.

Chapter Summary

None of the six proposals dominate in terms of being best across all the dimensions we evaluated—namely, their effects on recruiting outcomes, retention, personnel cost, and efficiency. Thus, deciding among them requires consideration of other factors. Therefore, we consider recent readiness outcomes and the broader context in which the proposal would be implemented to rank the proposals. There are three reasons why these other outcomes suggest that a more modest proposal should be chosen from among the six considered.

First, retention is strong across the services, despite the strength of the civilian economy. To the extent the services are experiencing pockets of retention problems, they can deploy incentive pays to address them; these are more efficient than pay raises in addressing such retention issues. Second, while the services are struggling to meet their recruiting missions, and several of them expect to miss their missions in the coming year, they are introducing a wide array of programs to improve recruiting. In addition, as noted earlier, raising military pay is the least cost-effective way to increase enlistments relative to bonuses, recruiters, and advertising. Finally, as noted earlier in the chapter, initial evidence using 2018 SOFS-A data merged with DMDC pay records suggests that average pay for food insecure junior enlisted members is not statistically different from the average pay of food secure service members at the 5-percent level.

Of the six proposals considered, the three most modest in terms of size of the pay increases (see Table 3.3 and Figure 3.4) are Proposal 4a (recruiting catch-up—7 percent), Proposal 5 (AVF catch-up), and Proposal 6 (boot camp catch-up proposal). Proposal 6 had the smallest effects on pay, recruitment, retention, and cost, but was the least efficient. Of the remaining two proposals, Proposal 5 dominated Proposal 4a in terms of having a lower increase in cost per service member and having a larger effect on high-quality enlistments, but was not as efficient and did not have as large an effect on retention. Thus, of these two proposals, the better approach depends on priorities; the AVF proposal is better if recruitment and cost control are more important, while the recruiting catch-up proposal is better if retention and efficiency are more important.

Finally, it is important to reiterate the finding that raising military pay is a blunt and costly instrument for addressing recruiting challenges. We find that increasing recruiters or enlistment bonuses could achieve the same improvement in high-quality enlistments as any of the six proposals, but at less cost. Given that retention is generally strong, the fact that raising junior pay would compress the pay table and increase cost, and initial evidence that shows that junior enlisted members who are food insecure do not have lower pay, the findings suggest that more targeted policies other than raising junior enlisted pay might be advisable.

CHAPTER 4

Midcareer and Senior Enlisted Basic Pay

As part of our project's support to the 14th QRMC's review of the military basic pay table, the 14th QRMC requested that we also consider whether the pay table for midcareer and/or senior enlisted personnel, as well as the table for officers, required adjustment. This chapter summarizes the analysis pertaining to enlisted personnel; Chapter 5 focuses on officers.

Our approach is similar to the analysis of junior enlisted pay. We review recent retention outcomes and pay comparisons and draw from the available literature on setting compensation within large organizations, as well as on military compensation within the military. We develop proposals for restructuring basic pay for midcareer and senior enlisted personnel, drawing on this literature and on input we received from discussion with SMEs within the OSD and the services. We then assess the proposals in terms of their effects on the structure of the pay table, as well as on readiness—specifically, retention and cost—using RAND's DRM. Finally, we consider proposals to link enlisted pay to officer pay to address pay inequity, drawing from the available literature on pay inequity within organizations.

Background

To assess the need for changes to the pay table for midcareer and senior enlisted members, we first considered how average RMC compares with the earnings of civilians with similar education and age. As shown in Table 2.4, the weighted average of RMC by YOS for enlisted members varies from about the 69th percentile to the 83rd percentile of civilian earnings for those with between ten and 20 YOS, where the weights reflect the distribution across different levels of education attainment among enlisted members. For those with over 20 YOS, the weighted average of RMC varies from the 72nd percentile to the 81st percentile. In short, average RMC exceeds the 70th percentile benchmark and would about equal the benchmark should it be raised to around the 75th to 80th percentile, as suggested in Chapter 3.

We also considered aggregate retention outcomes, by service, as reported by the OSD. As shown in Figure C.1, the services have generally met or exceeded their retention targets for initial term, midcareer, and career enlisted personnel in FY 2023. Reports for 2024 indicate similar success. Thus, military pay on average for midcareer and senior enlisted members compares favorably with civilian pay, and retention is strong overall.

That said, some SMEs with whom we spoke raised two main issues pertaining to the enlisted pay table (with some issues also relevant to officer pay, as will be discussed in Chapter 5). We describe what we heard for each of them.

Inadequate Performance Incentives Embedded in the Pay Table

We heard several issues pertaining to inadequate performance incentives. Some SMEs expressed concern about pay compression in the pay table if junior enlisted pay is increased without a similar increase for midcareer and senior personnel. Pay compression was discussed in the context of the proposals in Chapter 3. A more general point we heard was that the link between performance and basic pay was too weak and that the basic

pay increases in the pay table overemphasized additional longevity or YOS compared with promotion or better performance. A more specific comment we heard from SMEs was that performance incentives for more senior E-9s were too weak. Promotion to E-9 occurs at around 21 YOS. While these E-9s will still receive annual pay increases and some longevity increases, they have no further promotion opportunities. Some SMEs contrasted this situation with O-6s, who are also typically promoted at 20 YOS but have future potential promotion opportunities up to O-10. Some SMEs also noted that E-9s had varying level of responsibility, with some E-9s in supervisory positions over other E-9s, suggesting the need for additional grades beyond E-9.

We also heard proposals from the SMEs that are intended to address these performance incentive issues. Some SMEs suggested a targeted pay raise for E-9s to increase promotion incentives for senior enlisted members relative to longevity increases. As noted, we also heard the suggestion that the enlisted pay table be extended beyond E-9 to include additional grades and, notably, additional promotion opportunities for E-9s who hold more responsibility. However, some SMEs wondered if extending promotion opportunities for E-9s would be viewed as divisive among the cohesive E-7 through E-9 community. Finally, we heard the suggestion of a targeted pay raise for E-7s to recognize the increase in responsibility and better performance associated with advancement to this grade.

Inequality Between Officer and Enlisted Basic Pay

A second issue raised by some SMEs was the inequality in basic pay between enlisted members and officers, stating that enlisted personnel were used differently than they were 20 or 30 years ago. These SMEs discussed two specific issues.

First, they highlighted that across-the-board percentage increases in basic pay that were the same for officers and enlisted members resulted in growing absolute dollar disparities over time between the level of enlisted and officer basic pay. As a hypothetical example, consider an individual who earned $50 and another who earned $100, for a difference of $50 between the two ($100 − $50). A 20 percent across-the-board pay raise would raise pay to $60 for the first individual and to $120 for the second, with an increase in the absolute difference of $60 ($120 − $60). The relative gap in pay between the two individuals remains the same (50/100 = 60/120 = 0.5) while the absolute gap increases from $50 to $60. Some SMEs expressed concern that inequality between enlisted pay and officer pay in absolute terms has grown over time.

To address the growing absolute difference in officer and enlisted basic pay, some SMEs recommended that the differences between enlisted and officer basic pay be capped by either a fixed percentage amount or an absolute dollar amount. For example, in the 2023 basic pay table, an E-6 with over 20 YOS earns monthly basic pay of $7,102.8 while an O-6 with over 20 YOS earns $12,050.4 per month—about 70 percent more in relative terms, or $4,947.6 in absolute terms. Future differences might be capped at 70 percent in relative terms or $4,947.6 in absolute terms of some multiple of these values.

The second specific issue related to inequality raised by some SMEs is that basic pay for enlisted members is too low relative to officers with similar levels of responsibility. In one example given by an SME, an E-9 with 30 YOS earns less than an O-5 with 12 YOS in the pay table, despite similarities in their levels of responsibility and skill levels. SMEs who raised this issue recommended that enlisted pay be linked to officer pay to recognize similar responsibility levels and skills. For example, E-6 pay might be linked with O-3 pay, E-7 with O-4 pay, E-8 with O-5 pay, and E-9 pay with O-6 pay.

Toward Development of Proposals to Embed Stronger Performance Incentives in the Enlisted Basic Pay Table

We did not validate whether concerns about performance incentives are supported by analysis and data given the lack of such evidence and the challenges of measuring productivity and personnel performance in the

military. Instead we focused on whether the pay table is structured in a way consistent with providing performance incentives, as recommended in the literature, and how it might be improved.

In any large organization, including the military, key objectives of the personnel and compensation systems are to attract and retain enough people to meet its skill and experience requirements and with sufficient quality and ability to perform required tasks. In addition, these systems must motivate personnel to work hard and effectively and sort personnel by inducing higher-ability people to stay and seek advancement to higher ranks where their ability is most productive.

In the military, in the absence of lateral entry to the active force, senior leaders of the future must be recruited at entry. With its triangular hierarchical rank structure in which the upper ranks are filled by promoting those from the next-lowest level, advancement in the junior ranks is typically based on qualifications and time-in-grade requirements. Beyond this level, promotions are competitive and based on centralized promotion boards with promotion depending, notably, on current performance and potential future performance. Promotion rates drop sharply, and competition becomes increasingly fierce as people move up the ranks. Because of the triangular hierarchical rank structure, the productivity of those in the upper ranks has spillover effects on the productivity of those in the lower ranks. Since higher-ranked people control more of the organization's resources and make decisions that affect the overall performance of the organization, span-of-control considerations magnify the importance of ensuring that the most capable people are choosing to stay and eventually land in the upper ranks and that they are motivated to work hard and effectively.

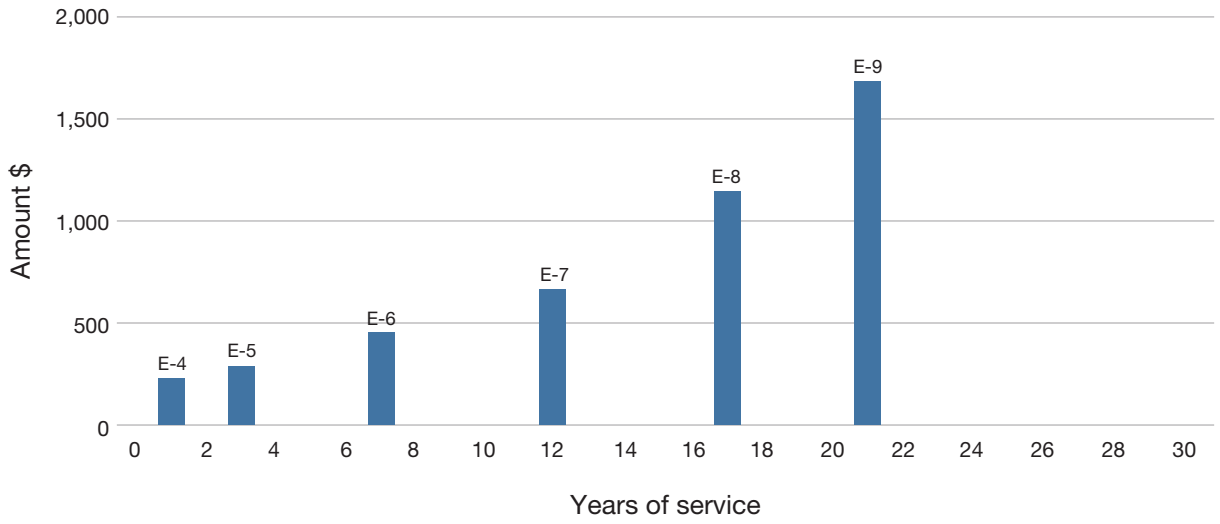
Given the constraints on lateral entry and its hierarchical structure, what attributes of the compensation system supports meeting these organization objectives? The economics literature provides theory and evidence regarding these attributes (Asch and Warner, 2001; Lazear and Oyer, 2012; Lazear and Rosen, 1981; Malcomson, 1984; Rosen, 1986; Rosen, 1992). It is important to recognize that compensation in this context refers to the compensation package, which may include not only cash pay but also expectations of future retirement benefits or other types of benefits. It could also include nonmonetary benefits, such as perquisites associated with higher-ranked positions.

The key attribute of the compensation system in the context of an organization like the military that promotes from within and is hierarchical in structure is that the compensation structure is curved or skewed, as was shown in a hypothetical example in Figure 3.1 in the context of junior enlisted pay. *Skewness* or *curvature* refer to the observation that differences in compensation between ranks increase with rank so that the pay levels of the most senior leaders are substantially higher than those of senior and midlevel managers, while the pay of midlevel managers is only modestly higher than the pay of the lower-ranked employees. Figure 4.1 shows another hypothetical example for enlisted members and shows the curvature of the system by YOS and grade. The figure shows the increase in monthly basic pay associated with each subsequent enlisted promotion. In this hypothetical example, the promotion to E-9—which, based on average promotion timing data between 2013 and 2018, typically occurs around the 21st year of service—produces a larger pay increase than earlier promotions.[1]

[1] These differences in pay between ranks also depend on the pay increases within a grade and, notably, the timing of promotion, in addition to the sequence of differences in pay across grades given average promotion timing. However, for brevity's sake, we focus here on the intergrade pay spreads, assuming average times for promotion at each grade. Elsewhere (Asch and Warner, 1994; Asch and Warner, 2001), the role of intragrade pay spreads and promotion timing in the structure of compensation is investigated. Also, as mentioned, incentives for effort and the sorting of higher-ability personnel can be influenced not just by pay but also by nonmonetary factors associated with promotion, plus elements of compensation that increase with promotion—notably, retirement benefits. The retirement system adds a degree of skewness to the compensation system, given the 20-year vesting in an immediate annuity, and permits a flatter pay structure in the pay table to produce the same retention and effort outcomes that would occur with a less generous system. Other elements of military compensation that could increase skewness are the BAH and the tax advantage, both of which increase with grade. While we use the term pay in the following discussion of skewed pay structures, the discussion extends to include the other elements of monetary and nonmonetary compensation that increase with promotion.

FIGURE 4.1

Hypothetical Example: Increase in Monthly Basic Pay Associated with Enlisted Promotion, by Years of Service

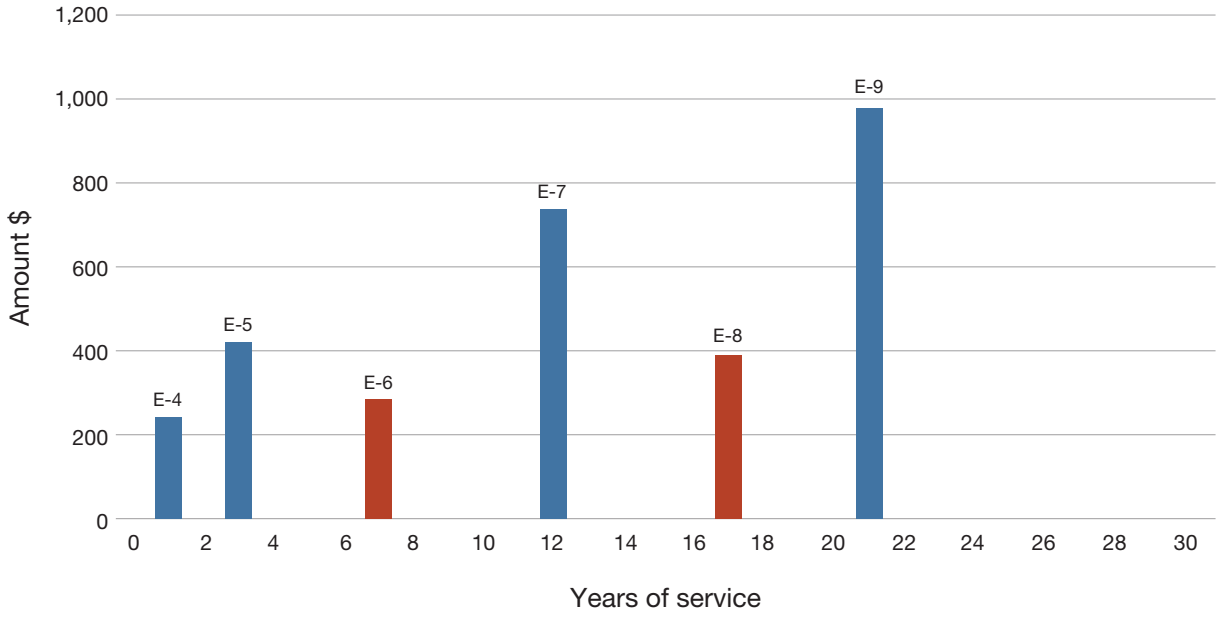


Larger pay spreads motivate harder work, encourage more capable personnel to remain in the organization, and sustain the quality of the talent pool from which promotions are made. There are three rationales for larger spreads at higher ranks—that is, the curved shape of the compensation structure. First, as individuals progress toward the senior ranks, promotion rates fall, which tends to decrease the expected payoff to advancement and thereby discourage effort and the sorting of higher-ability personnel. Pay spreads need to rise with rank—they need to be skewed or curved—to maintain effort and incentives for ability sorting. Second, as personnel progress through the ranks, the number of remaining promotions that can be earned, and therefore the number of future promotion rewards, falls. To offset the declining incentives for performance due to the declining number of future promotions, the reward associated with later promotions must increase—the structure must be skewed. Finally, competition for promotion becomes keener in higher ranks because the talent pool becomes one of a uniformly higher quality—the lower-quality personnel are more likely to have been screened out at lower promotions. This will tend to reduce effort incentives, because bypassing one's competitors and achieving promotion becomes more difficult to achieve at higher grades. To offset this disincentive, the pay spread or reward to promotion must increase at higher grades.

Figure 4.2 shows how the structure of the enlisted basic pay table deviates from the idealized curved structure shown in Figure 4.1. Importantly, it lacks the desired curvature, with two areas of concern. First, rather than increasing with higher ranks, the pay increases associated with promotion to E-6 and to E-8 *decrease* relative to the previous grade, thereby working counter to a structure that sustains performance incentives across ranks. Specifically, given average enlisted promotion times for 2013–2018, the increase in basic pay for a promotion to E-5 at the third year of service in the 2023 pay table was about $425 but decreased to $288 for a promotion to E-6. A promotion to E-8 at 17 YOS increased basic pay by $392, but a promotion to E-7 at 12 YOS increased basic pay by $730. The decrease associated with the promotion to E-8 is offset by the expectation of becoming eligible for military retirement benefits at 20 YOS, since an E-8 promoted at the seventeenth year of service is virtually assured to become eligible for these benefits, which provide an additional financial incentive associated with promotion to E-8.

The second area of concern is the lack of promotion opportunities for those who achieve the highest rank of E-9, typically at the 21st year of service based on 2013–2018 promotion timing data. For an E-9 who serves another ten or 20 years, to 30 or 40 YOS, the only sources of basic pay increases are longevity increases

FIGURE 4.2
Current Enlisted Pay Table: 2023 Increase in Monthly Basic Pay Associated with Enlisted Promotion, by Years of Service



NOTE: Tabulations assume average DoD enlisted promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

and annual basic pay increases, neither of which are specifically tied to performance. Thus, the basic pay structure does not provide performance incentives for the highest-ranked enlisted personnel, though other aspects of service, including nonmonetary factors, could contribute to these incentives.

Past Consideration Given to Adding an E-10 Grade

To address the issue of performance incentives for E-9s, in its 2002 report the 9th QRMC raised the question of whether an additional grade is needed beyond E-9. Specifically, citing analysis of the issue conducted by Quester and Lee (2001), it noted,

> The E-9 grade does not adequately distinguish among the varying responsibility levels of E-9 assignments. Today, E-9s supervise E-9s, who supervise other E-9s—similar to the situation in 1958 within the E-7 grade, which led to creation of the E-8 and E-9 grades. (DoD, OUSD[P&R], 2002, p. 45)

The Quester and Lee (2001) study also noted that E-9 compensation is mostly based on overall YOS, with those who are fast-tracked and promoted faster earning less than those promoted more slowly and with higher retirement rates among the fast-tracked E-9s. The QRMC saw the value of adding an E-10 grade despite it being numerically small—Quester and Lee recommended that E-10s be no more than 0.2 percent of the enlisted force—with a competitive promotion from among the best E-9s and an appropriate increase in basic pay. Quester and Lee thought that a pay increase of around 10 percent might be such an appropriate increase in basic pay relative to E-9.

The 9th QRMC indicated that the idea of adding an E-10 grade offered potential benefits, but the proposal was not fully supported. The report of the 9th QRMC stated that "an E-10 grade could motivate individuals to depart at the same or greater rate than is currently the case because of a perception of limited opportunities at the E-10 level" (DoD, OUSD[P&R], 2002, p. 47). Based on personal communications with

key staff of the 9th QRMC, our project learned about other concerns expressed at the time of the 9th QRMC. The centerpiece of the suite of recommendations proposed by the 9th QRMC was the recommendation for a targeted pay increase to midcareer and senior personnel, and some felt at the time that pursuing an additional E-10 grade could detract from that other effort. Another concern was that the cost of implementing a new E-10 grade was too "heavy of a policy lift" because of the need to identify manpower requirements and billets, define promotion criteria, and upgrade supporting systems. Finally, other alternatives might be considered that did not involve adding a new grade, including making more use of the warrant officer grades or the transition from enlisted to officer grades, or even slowing promotions in earlier enlisted grades.

Description of the Four Proposals

We consider four proposals to restructure the enlisted pay table to address the two areas of concern regarding performance incentives, the decrease in the pay increase for E-6s and E-8s and the lack of further promotion opportunities for E-9s later in their career. Three of the proposals would add an E-10 grade, consistent with the 9th QRMC, and three would provide targeted pay raises for midgrade and senior enlisted personnel. Table 4.1 summarizes the proposals and their motivation. We describe each proposal in turn and show how the proposal would affect the structure of pay increases across enlisted grades.

Proposal 1

Proposal 1 would add an E-10 grade for the purpose of providing additional promotion opportunities and stronger performance incentives to the most competitive E-9s. The proposed pay table is shown in Table D.1 in Appendix D. To compute E-10 pay at each year of service, we increased E-9 basic pay by 17 percent between ten and 20 YOS. The 17 percent figure was chosen because this is the current percentage difference between E-8 and E-9 basic pay at these YOS. In the current pay table, the percentage difference between E-8 and E-9 basic pay is greater than 17 and an alternative would be a pay table that also gives raises even greater than 17 percent to those in E-10 beyond 28 YOS.

TABLE 4.1
Proposals to Increase Midcareer and Senior Enlisted Basic Pay

Proposal	Motivation	Description
1. Add E-10 grade	Provide additional promotion incentives to top E-9s	Compute E-10 basic pay equal to 17% increase over E-9 through the 28th year of service
2. Add E-10 grade plus targeted E-6 to E-9 raises	Same as Proposal 1, plus ensure that E-6 and E-8 promotions are at least as valuable as previous promotions	Same as Proposal 1, plus target pay raises around average promotion times with E-7 and E-9 increases given to avoid pay inversions
3. Add E-10 grade plus targeted E-6 to E-7 raises	Same as Proposal 1, plus ensure that E-6 promotions are at least as valuable as previous promotions	Same as Proposal 2, but omit the E-8 promotion increase because it occurs prior to retirement eligibility, and omit the E-9 increase because E-9 pay inversion disappears
4. Targeted E-6 to E-9 raises, no E-10 addition	Focus pay raises on restructuring the existing pay table	Same as Proposal 2, but omitting the addition of E-10

NOTE: Proposals 1–3 would also increase Senior Enlisted Advisor basic pay by 4.1 percent relative to the basic pay of an E-10 at 40 YOS. The 4.1 percent figure was chosen because this is the percentage difference under the current pay table between Senior Enlisted Advisor basic pay and the basic pay of an E-9 with 40 YOS.

As indicated in the note to Table 4.1, Proposal 1, as well as Proposals 2 and 3, which also add an E-10 grade, would involve increasing the basic pay of Senior Enlisted Advisors. Today a Senior Enlisted Advisor's basic pay is 4.1 percent higher than that of an E-9 with 40 YOS. To maintain this relationship, Senior Enlisted Advisor basic pay in Proposals 1–3 would be increased by 4.1 percent relative to the basic pay of an E-10 with 40 YOS.

In our analysis of this proposal, discussed in the next section, we assume that E-10s are promoted on average at 26 YOS, but this is for illustration purposes and not based on any analysis or discussions with the services of when promotions to E-10 might occur should an additional grade be created. We also assume that E-10s would only make up 0.2 percent of the enlisted force and that 10 percent of E-9s are promoted to E-10.

As shown in Figure 4.3, the pay increment associated with promotion to E-10—highlighted in red—would provide additional promotion opportunities and financial incentives for performance for E-9s and potentially also for E-8s.

Proposal 2

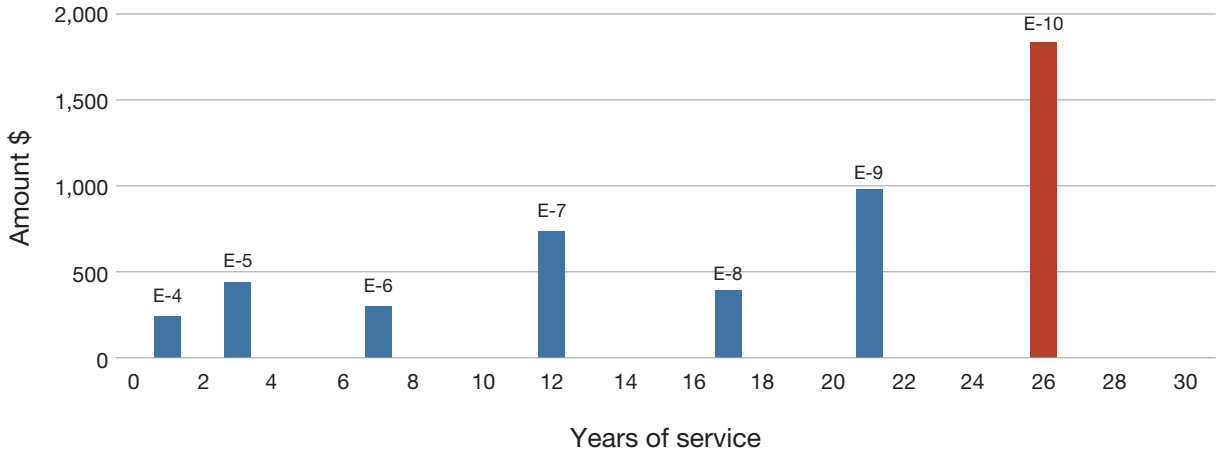
Proposal 2 would add an E-10 grade but would also include targeted pay raises for E-6s through E-9s. The focus of the targeted raises is on E-6 and E-8 to address the structural concerns shown in Figure 4.2 for those grades. But to prevent pay inversions in the pay table where pay does not increase with longevity or promotion, we found that we also need to include targeted pay raises to E-7s and E-9s. Figure 4.4 shows how this proposal would change the pay increases associated with promotion to E-6 to E-9 (and E-10) given average promotion times. The figure shows that promotions to E-6 and to E-8 are now generally at least as valuable as promotions to their previous grades (E-5 and E-7, respectively). The revised pay table is shown in Table D.2.

Proposal 3

Proposal 3 is similar to Proposal 2 but omits the targeted raises to E-8 and therefore the targeted raises to E-9 since the pay inversion problem disappears if E-8 pay is unchanged. The justification for this proposal is that the financial incentives for promotion to E-8 also include the virtual certainty of qualifying for higher military retirement benefits, a factor not shown in Figure 4.2. The increases in monthly pay associated with promotion under this proposal are shown in Figure 4.5. The revised pay table is shown in Table D.3.

FIGURE 4.3

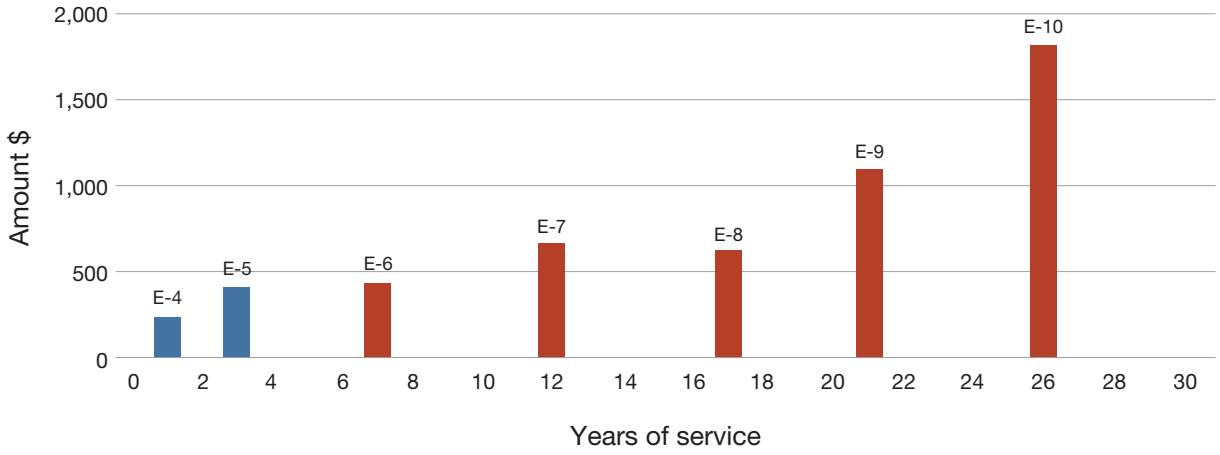
Proposal 1, Adding E-10 Grade: 2023 Increase in Monthly Basic Pay Associated with Enlisted Promotion, by Years of Service



NOTE: Tabulations assume average DoD enlisted promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

FIGURE 4.4

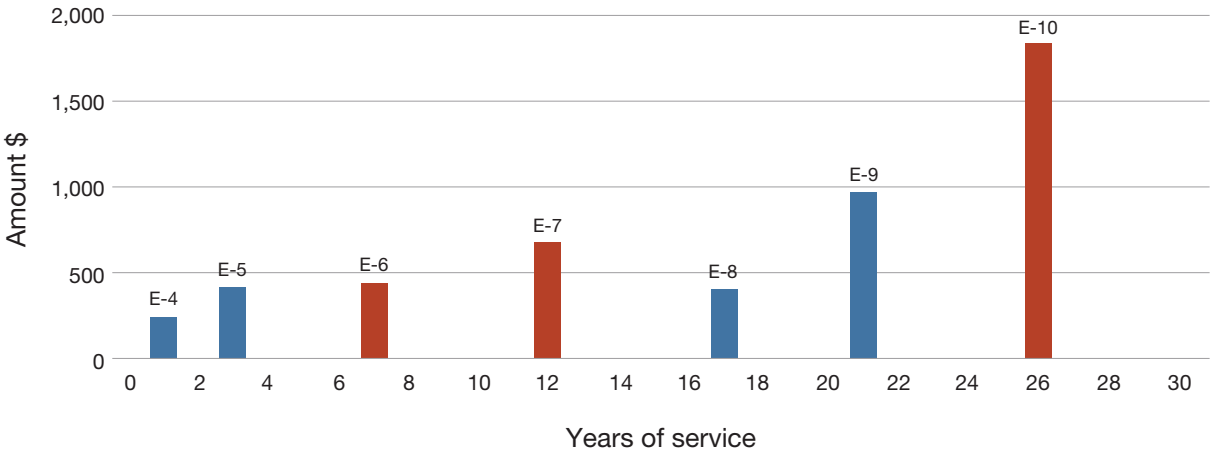
Proposal 2, Adding E-10 Grade and Targeted E-6 Through E-9 Raises: 2023 Increase in Monthly Basic Pay Associated with Enlisted Promotion, by Years of Service



NOTE: Tabulations assume average DoD enlisted promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

FIGURE 4.5

Proposal 3, Adding E-10 Grade and Targeted E-6 Through E-7 Raises: 2023 Increase in Monthly Basic Pay Associated with Enlisted Promotion, by Years of Service

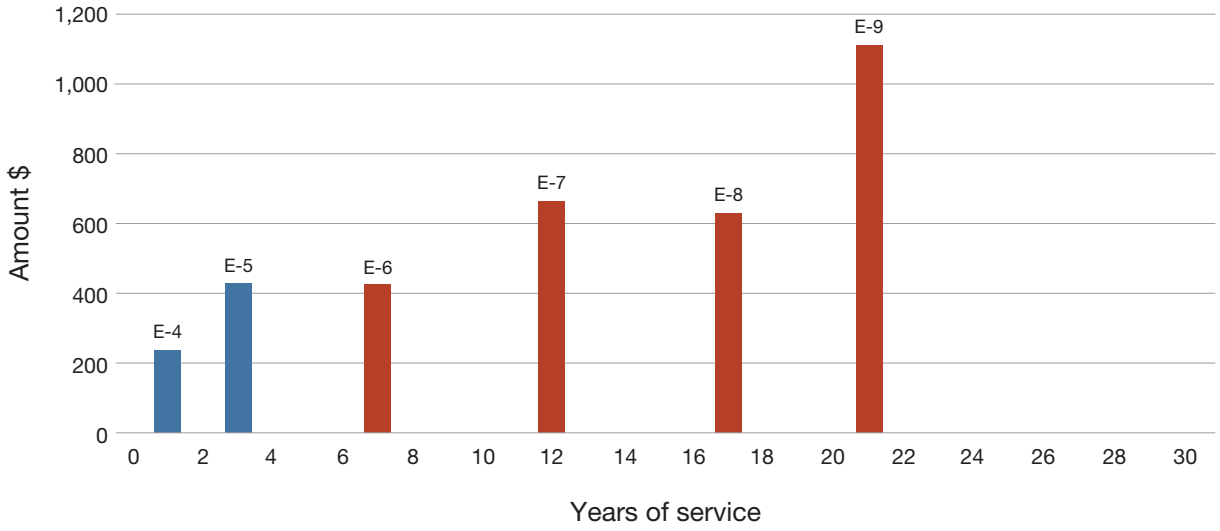


NOTES: Tabulations assume average DoD enlisted promotion times for 2013–2018 based on DMDC tabulations provided to RAND. Tables D.6, D.8, D.10 present analogous results for other services under the assumption 10 percent of E-9s are promoted to E-10. Tables D.12, D.14, D.16, and D.18 give analogous results when 50 percent of E-9s are promoted to E-10 for all services.

Proposal 4

The final alternative is the same as Proposal 2 but omits the addition of the E-10 grade. The justification for this proposal is that it would address the performance incentives issues for E-6 and E-8 in the existing enlisted pay table without the potentially "heavy lift" of creating a new pay grade. The increases in monthly pay associated with promotion are shown in Figure 4.6. The proposed pay table is shown in Table D.4.

FIGURE 4.6
Proposal 4, Targeted E-6 Through E-9 Raises: 2023 Increase in Monthly Basic Pay Associated with Enlisted Promotion, by Years of Service



NOTE: Tabulations assume average DoD enlisted promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

Assessment of the Proposals

Effects on Retention, Personnel Costs, and Performance

Similar to our analysis of junior enlisted pay in Chapter 3, we estimate the steady state retention and cost effects of the four proposals in Table 4.1 using RAND's DRM estimates for enlisted personnel in each service produced for the 13th QRMC (Asch, Mattock, and Tong, 2020). As with the junior enlisted pay analysis, we show results for Army enlisted personnel in this chapter, though results for the other services are qualitatively similar and are shown in Appendix D.

We estimate retention and cost effects for each of the four proposals to change the pay table for midcareer and senior enlisted personnel. The results are shown in Table 4.2. The first row shows the baseline results for Army enlisted personnel without any basic pay table changes. For example, we estimate that in the steady state, an Army enlisted accessing member is expected to provide 4.547 man-years over their career. Per person cost for the enlisted force in the baseline is estimated to be $74,652 for basic pay and retirement accrual costs. The subsequent rows show the results for each of the four proposals in terms of percentage change relative to the baseline, and the columns also include estimates of the incremental cost associated with the increase in retention—what we call the marginal cost of raising pay under each proposal. To compute the marginal cost, we take the ratio of percentage increase in cost per service member relative to the baseline over the percentage increase in retention (measured as the percentage increase in expected man-years per accession relative to the baseline). The lower the ratio, the lower the marginal cost estimate and the more efficient the proposal is in terms of producing more retention for a given increase in cost per service member. The final two columns show the change in the annual budgetary cost of basic pay and the retirement accrual cost to the Army and to DoD overall in billions of 2023 dollars.

Given that all four proposals increase basic pay, we find that all of them also increase retention, as well as cost. Proposal 1 has the most modest effect on retention given that E-10s would make up a very small share

TABLE 4.2

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Army Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Army Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	4.547	$74,682			
1. Add E-10 grade	0.2%	0.2%	1.17	$0.007	$0.021
2. Add E-10 grade plus targeted E-6 to E-9 raises	5.8%	3.4%	0.59	$0.069	$0.153
3. Add E-10 grade plus targeted E-6 to E-7 raises	5.5%	3.2%	0.59	$0.056	$0.128
4. Targeted E-6 to E-9 raises, no E-10 addition	5.6%	3.2%	0.57	$0.062	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTES: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. Assumes 10 percent of E-9s are promoted to E-10. See Appendix D for results if we assume 50 percent of E-9s are promoted to E-10. Tables D.5, D.7, and D.9, present the same analysis for what happens when 10 percent of E-9s are promoted to E-10 for Navy, DAF, and Marines respectively. Tables D.11, D.13, D.15, and D.17 present analogous results for what happens when 50 percent of E-9s are promoted to E-10 for Army, Navy, DAF, and Marines.

of the enlisted force. Man-years per accession are predicted to increase by 0.2 percent, while cost per service member would also increase by 0.2 percent. The increase in the annual budgetary cost to the Army is predicted to be $7 million, and it would be $21 million across DoD. Proposal 2 has the largest effect on retention and on cost given that it also includes targeted pay raises for E-6s to E-9s. Retention is estimated to increase by 5.8 percent, while costs per person are expected to increase by 3.4 percent. It also has the largest increase in annual budgetary cost to the Army ($69 million) and to DoD ($153 million).

Proposals 3 and 4 are more modest changes than Proposal 2, and the estimated increases in retention and cost are somewhat smaller. The middle column shows estimates of marginal cost and provides information on the relative efficiency of each proposal. Proposals 2–4 are about equally efficient, with estimated marginal costs of 0.57 to 0.59. Proposal 1 is less efficient, with an estimated marginal cost of 1.17, meaning that to produce a given increase in retention, a higher cost must be incurred under this proposal than under the other proposals. On the other hand, under Proposal 1, the increase in retention occurs among the most experienced personnel in the most senior grades of the enlisted force, while under Proposals 2–4 the increase in retention occurs among less experienced personnel since those proposals target pay raises to midgrade service members.

Predicted Effects on Retained Ability

We use the DRM parameter estimates from Asch, Mattock, and Tong (2020) to simulate the performance effects of each proposal relative to the baseline. We do not observe performance, nor do we have data on performance, and collecting such data was beyond the scope of the project given the challenges of measuring personnel productivity in the military. Instead we use the method of calibration (Dawkins, Srinivasan, and Whalley, 2001). The simulations assume that a service member's promotion speed depends on performance—those who perform better are promoted faster—which, in turn, depends on innate ability. We do not observe ability but treat it as a unitless index. We also assume those with higher ability have better external civilian

opportunities, and we assume that ability differs among military entrants, following a normal distribution with a mean and standard deviation (SD) that we assume. The assumed parameters are calibrated or chosen so that we can replicate the observed aggregate retention profile over an enlisted career in each service. We then conducted sensitivity analyses to understand how results differed under alternative assumptions. The details of this methodology are described in Asch, Mattock, and Tong (2020).

Table 4.3 summarizes the results on ability for Army enlisted personnel. To report results, we compute each service member's simulated percentile in the ability distribution (i.e., the 50th percentile would represent the median) and then report the average ability of the force overall in terms of the mean ability percentile. To assess the extent to which each proposal induces the selective retention of higher-ability personnel into higher grades (i.e., ability sorting), also report the average ability percentile among E-5s, E-9s, and, for Proposals 1–3, E-10s.

Let us first consider the baseline results. We find that the current structure of the pay table is highly selective on ability; the average ability of those in the E-9 grade who are under the baseline (59.2) is substantially higher than the average ability of those in E-5 (41.6). Thus, the current structure successfully induces higher-ability personnel to stay and advances them to higher grades while simultaneously weeding out and inducing lower-ability personnel to leave before being promoted.

Adding an E-10 grade without any other targeted increases (e.g., Proposal 1) would not change the overall average ability of the force—it would remain at 46.8, but higher-ability E-9s would be promoted to E-10, resulting in an average E-10 ability of 67.3 but a slightly lower average ability among E-9s of 58.1. Adding targeted pay raises to earlier grades, as in Proposals 2 and 3, would increase the overall ability of the force—to 47.4 under Proposal 2 and to 47.2 under Proposal 3, since higher-ability personnel would have a stronger incentive to stay across the force. These proposals would also improve the average ability of E-5s, as well as E-9s with the increases larger under Proposal 2. Under this proposal, the average ability of E-5s increases from 41.6 to 42.0, and from 59.2 to 61.3 for E-9s, with the increase for E-9s larger than for E-5s, implying strong incentives for ability sorting. Further, E-10 average ability is estimated to be 67.2. Thus, these proposals would further enhance the ability sorting of the current pay table by inducing higher-ability personnel to stay and promoting them to higher grades.

Proposal 4 would target pay raises to E-6 through E-9 without the addition of an E-10 grade. This proposal would also increase retention among higher-ability personnel, since the average ability of the force would increase from 46.8 to 47.4. It would also improve the ability sorting of the current system; the average ability of E-5s would increase by 0.4 percentile (42.0 − 41.6) while the average ability of E-9s would increase by 3 percentiles (62.2 − 59.2).

TABLE 4.3
Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Army Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	46.8	41.6	59.2	N/A
1. Add E-10 grade	46.8	41.6	58.1	67.3
2. Add E-10 grade plus targeted E-6 to E-9 raises	47.4	42.0	61.3	67.2
3. Add E-10 grade plus targeted E-6 to E-7 raises	47.2	41.9	61.1	68.6
4. Targeted E-6 to E-9 raises, no E-10 addition	47.4	42.0	62.2	N/A

SOURCE: Authors' calculations using RAND's DRM.

The main finding is that all four proposals would improve retention and ability sorting—inducing higher-ability personnel to stay and be promoted—but would also increase costs.

Addressing Pay Inequity by Linking Enlisted and Officer Basic Pay

Growing Absolute Differences in Officer and Enlisted Basic Pay

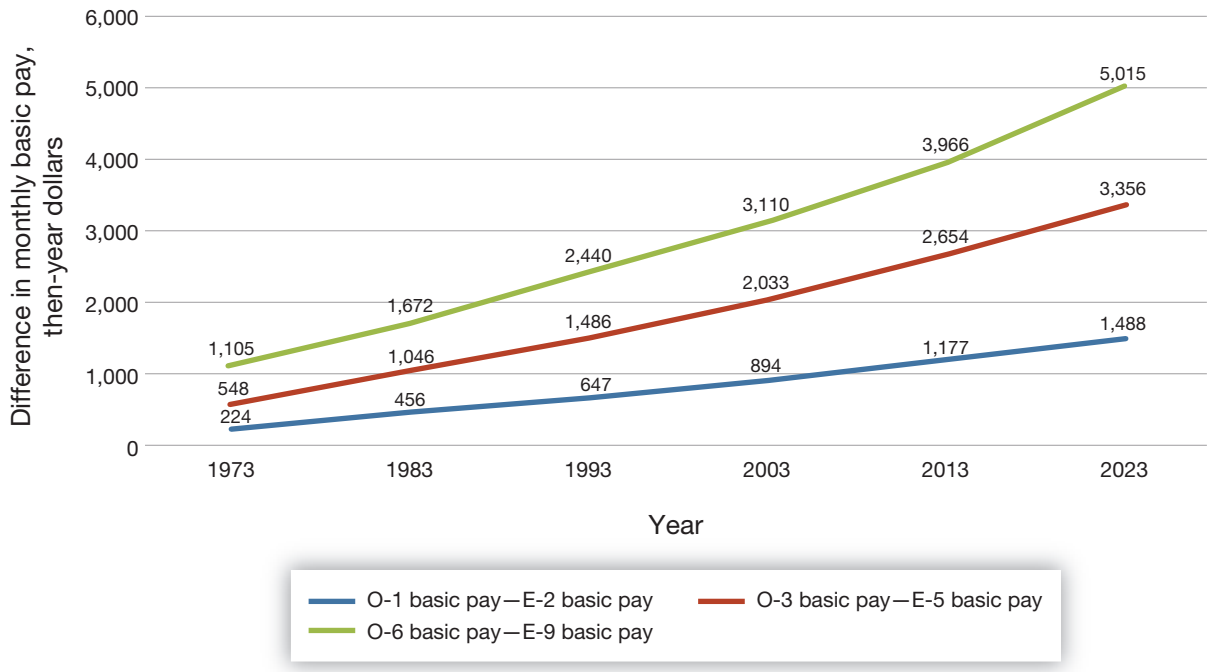
As was discussed earlier in this chapter, some SMEs expressed concern that annual percentage increases in monthly basic pay have resulted in widening absolute dollar differences over time between officer and enlisted basic pay. One suggestion we heard in the SME discussions was to cap the differences between officer and enlisted basic pay.

This suggestion to decrease pay inequity between enlisted and officer pay is based on the concept of fairness, with larger absolute differences feeling increasingly unfair. On the other hand, with an AVF, the military must compete for talent to fill its ranks, and both enlisted pay and officer pay must be set competitively to attract and retain this talent. If enlisted pay is efficiently set, then raising enlisted pay to improve fairness and reduce differences between enlisted and officer pay would raise costs, create additional economic rents, and increase potential supply relative to manning requirements, which in turn might cause oversupply or, alternatively, tighter retention requirements. In other words, greater emphasis on equity comes at the cost of efficiency, as we discuss further below.

The concern raised by some SMEs is illustrated in Figure 4.7, which shows the absolute dollar difference in monthly basic pay in then-year dollars between officers and enlisted personnel, over time, for selected grades. In 1973, the difference between the monthly basic pay of an O-1 and E-2 with fewer than two YOS

FIGURE 4.7

Difference Between Officer and Enlisted Monthly Basic Pay over Time, in Then-Year Dollars



SOURCE: Authors' calculations using 1973–2023 basic pay tables.

NOTE: Chart shows O-1 and E-2 basic pay for those with fewer than two YOS, O-3 and E-5 basic pay for those with over six YOS, and O-6 and E-9 basic pay for those with over 24 YOS.

was $224. This difference grew to $1,488 in 2023. Similarly, the difference between the monthly basic pay of an O-6 and E-9 with more than 24 YOS was $1,105 in 1973, growing to $5,015 in 2023.

Figure 4.8 shows that these differences disappear when accounting for inflation. The figure shows the same differences as in Figure 5.6 but in 2023 dollars. Thus, the $224 dollar difference between the monthly basic pay of an O-1 and E-2 in 1973 dollars translated to a difference of $1,536 in 2023 dollars, greater rather than less than the $1,488 difference in 2023. We find similar results when we compare O-3 pay with E-5 pay and O-6 pay with E-9 pay. Table 4.4 shows the same information and illustrates the same result but in a different way. The table shows the ratio of officer to enlisted pay at these selected grades. Consistent with Figure 4.8, the ratios decrease or are roughly constant over time, depending on which years are compared.

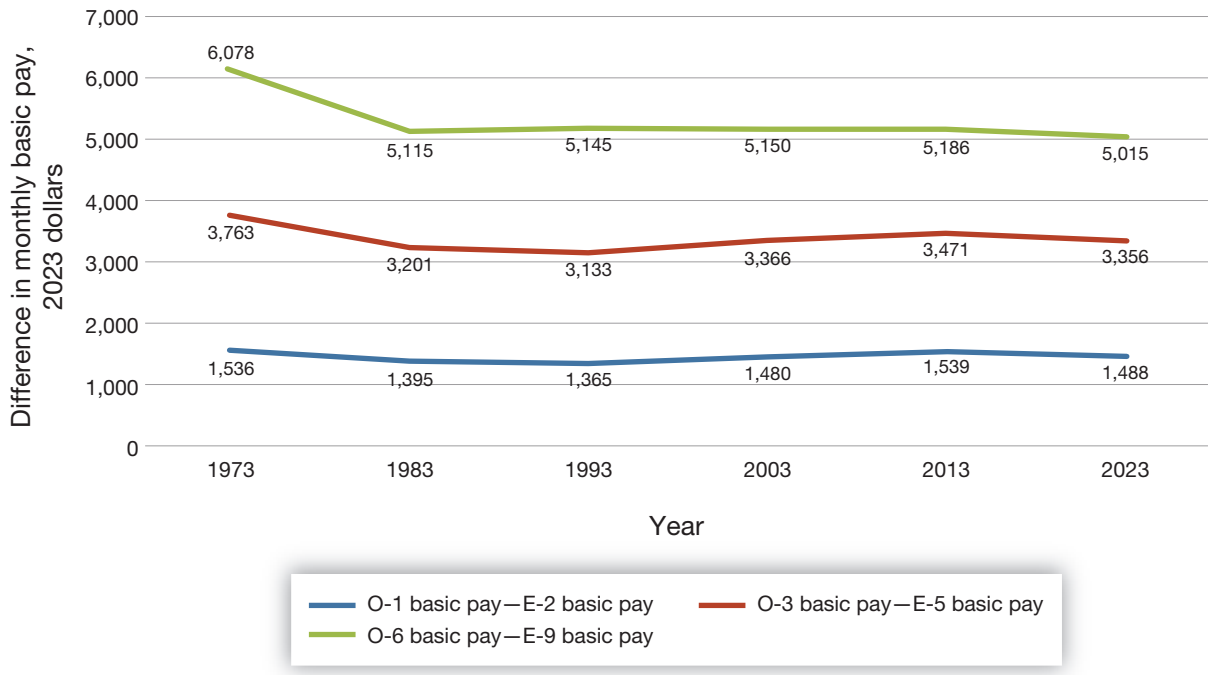
The implication is that inequality between officer and enlisted monthly basic pay has not increased significantly in real value over the 50 years of the AVF. The broadly constant relationship between real enlisted and officer pay shown in Figure 4.8 and Table 4.4 results from pay increases that have largely been across the board and equally applied to enlisted members and officers, although some years had exceptions by also including targeted pay raises.

Pay inequality within organizations has received renewed attention in recent years not just in the military but also in the civilian world. Some of this renewed interest is a result of the 2015 Dodd-Frank Wall Street Reform and Consumer Protection Act, which requires private-sector companies to disclose the ratio of median employee pay to that of the chief executive officer. This requirement has led to questions, as well as research about how pay disparities within an organization affect employee morale, productivity, and company performance.

Research from the civilian world also suggests that pay disparities do not adversely affect employee output, attendance, and group cohesion unless workers perceive that higher-paid peers are not more productive

FIGURE 4.8

Difference Between Officer and Enlisted Monthly Basic Pay over Time, in Real 2023 Dollars



SOURCE: Authors' calculations using 1973–2023 basic pay tables.

NOTE: The figure shows O-1 and E-2 basic pay for those with fewer than two YOS, O-3 and E-5 basic pay for those with over six YOS, and O-6 and E-9 basic pay for those with over 24 YOS.

TABLE 4.4
Ratio of Officer Basic Pay to Enlisted Basic Pay over Time

	1973	1983	1993	2003	2013	2023
O-1 to E-2 basic pay (fewer than 2 YOS)	1.65	1.71	1.71	1.69	1.69	1.69
O-3 to E-5 basic pay (over 6 YOS)	2.12	2.08	2.08	2.00	1.98	1.98
O-6 to E-9 basic pay (over 24 YOS)	2.39	1.83	1.82	1.69	1.65	1.65

SOURCE: Authors' calculations using 1973–2023 basic pay tables.

NOTE: Research on private-sector firms provides evidence that larger firms pay higher wages especially to their chief executives and have larger pay disparities between employees across hierarchical levels. These studies also find that firms with larger pay disparities also have stronger operating performance, higher valuations, and larger equity returns (Faleye, Reis, and Venkateswaran, 2013; Mueller, Ouimet, and Simintzi, 2017a; Mueller, Ouimet, and Simintzi, 2017b). These results are consistent with the hypothesis that larger firms require more managerial talent at the top to be successful and require higher pay and compensation to attract and retain that talent. An implication of these results is that capping pay differences would hurt firm performance by inhibiting the ability of firms to attract and retain better talent at the higher hierarchical levels.

(Breza, Kaur, and Shamdasani, 2018; Faleye, Reis, and Venkateswaran, 2013). Cullen and Perez-Truglia (2022) find that employees are motivated by well-paid managers but demotivated by well-paid peers in the same unit and same position.

This research has two implications for pay differences between officers and enlisted members. First, capping the differences would likely hurt military organizational performance by hurting the ability of the services to attract and retain higher-quality personnel who will eventually fill upper-ranked managerial positions. Capping differences could result in pay that is too high for some personnel (and excessively costly for the military) and too low for other personnel. Ultimately, military compensation should be set to meet its objectives as outlined in the *Military Compensation Background Papers* (DoD, OUS[P&R], 2018a). Second, to the extent that employees are demotivated by pay differences that they perceive are not explained by differences in productivity and contributions to the organization, DoD should better articulate why officer and enlisted pay tables differ and why officer pay is higher.

Paying People the Same Amount for Similar Job Responsibility

Another concern we heard in some SME discussions is that senior enlisted personnel hold positions of comparable responsibility—as officers, in some cases—yet their pay is lower. Some SMEs recommended that enlisted pay be formally linked to officer pay to reflect similar job content and responsibility.

The policy of equal pay for jobs of similar worth, usually defined in terms of skill, effort, responsibility, and working conditions, is known as comparable worth (O'Neill, Brien, and Cunningham, 1989). Comparable worth gained popularity in the 1970s and 1980s and was viewed by proponents as a means of addressing lower pay in female-dominated occupations, such as teaching, relative to male-dominated fields. The idea behind comparable worth is that job content would be evaluated on a point system that would assign jobs with similar content the same points, and jobs with similar points would be paid the same wage.

The adoption of the policy was limited to the state and local government levels. Both Congress and the executive branch attempted to adopt comparable worth policies at the federal level in the 1970s and 1980s, but federal policy had a major setback in 1985 when the Federal Court of Appeals rejected comparable worth job evaluation as evidence of discrimination in the state of Washington. Comparable worth initiatives were adopted in 14 states, including Idaho, Minnesota, and Washington, and in local jurisdictions such as San Jose, California (Ehrenberg and Smith, 1987; Killingsworth, 2002; O'Neill, Brien, and Cunningham, 1989).

A review of the literature on the effects of comparable worth policies on wages suggest that these policies generally succeeded in increasing wages in female-dominated occupations, though studies differ on the extent of the increase (Ehrenberg, 1989; Ehrenberg and Smith, 1987; Killingsworth, 2002; O'Neill, Brien, and Cunningham, 1989). However, pay differences between female- and male-dominated occupations were not

eliminated by comparable worth policies, leading some proponents to become disenchanted with comparable worth as a means of eliminating gender differences in pay (Killingsworth, 2002). According to Killingsworth (2002, p. S183), some unions also opposed comparable worth policies because of fears that "pay equity increases for some jobs" would result in wage cuts either explicitly or implicitly for others.

Researchers have also investigated whether pay equity increases due to comparable worth induced employers to shift employment away from more costly workers. O'Neill, Brien, and Cunningham (1989) find evidence of employment shifts in the state of Washington. The share of employment in occupations receiving comparable worth pay adjustments was reduced, suggesting that comparable worth resulted in reductions in employment in female-dominated occupations. Ehrenberg and Smith (1987) also estimate the employment effects of comparable worth but find only a small reduction in female employment.

Comparable worth policies have lost favor among proponents. As noted, comparable worth reduces but does not eliminate gender pay differences, and evidence suggests that these policies can reduce employment in female-dominated occupations. Further, research indicates that pay gaps are also attributable to other factors that are not considered in studies of pay gaps that are both measurable (e.g., hours worked), and not measurable (e.g., work flexibility; Levine, 2004; O'Neill, undated). Another challenge with comparable worth policies is implementation of an unbiased and defensible job evaluation process. Job evaluation requires a systematic and defensible means of assigning points to each job attribute and determining the weights assigned to different types of attributes. Developing such a scheme is costly and can be inherently subjective. As O'Neill (undated) states, "Different job evaluation systems and different job evaluators are likely to assign different rankings to the same set of occupations."

Economists have tended to be highly critical of comparable worth policies because they substitute job evaluation for market conditions in setting pay and they ignore the supply and demand factors that influence pay levels in the market. Ignoring these factors in the pay-setting process can result in shortages of workers in some cases and an oversupply in other cases. As Gunderson notes,

> Some jobs may have a high "value-in-use" as measured by the inputs of skill, effort, and responsibility, but they may not warrant a high wage (i.e., "value in exchange" for labor services) if there is a plentiful supply of workers to perform them. (Gunderson, 1989, p. 55)

In the context of addressing differences in enlisted and officer basic pay, adopting a comparable worth policy would move the pay-setting process away from such considerations as retention, recruitment, motivation, and the other principles of military compensation that have guided the setting of military pay for decades. It would de-emphasize career progression considerations that are specific to the enlisted force versus the officer force, such as Defense Officer Personnel Management Act rules for officers and differences in retention patterns between the two forces. Further, it could result in talent management difficulties or inefficiencies because it could result in pay that is too high for some parts of the force and too low for others and could thus induce the services to change the size and experience mix of the enlisted and officer forces in response to these pay differences. Further, it would require an extensive and objective job evaluation process that could be difficult to implement given the challenges of measuring military productivity.

Chapter Summary

While enlisted retention has been strong overall and average RMC among midcareer and senior enlisted members compares well relative to civilian pay, our SME discussions raised concerns about the adequacy of performance incentives in the enlisted pay table (especially for midcareer personnel and E-9s) and about pay inequality relative to officers. The 9th QRMC considered the creation of a new grade, E-10, and we found that

SMEs raised many of the same issues today as were raised in the context of the 9th QRMC, including the lack of performance incentives for E-9s and E-9s supervising other E-9s.

Because of the challenges of measuring military personnel productivity, evaluating whether midcareer and senior enlisted personnel productivity falls short of expectations was beyond the scope of our analysis. Instead we evaluated four proposals to increase performance incentives, three of which would add a new E-10 grade and one that would only provide targeted pay raises to E-6s through E-9s. We measure performance in terms of ability in our modeling and find that adding an E-10 grade is predicted to increase retention and, if coupled with a targeted pay raise for E-6s through E-9s, increase average ability of the force by increasing the retention and promotion incentives of higher-ability personnel. However, personnel costs also increase, though the proposals that include targeted pay raises were the most efficient compared with only adding the E-10 grade without a targeted pay raise.

We find that the absolute differences between officer and enlisted pay have grown over time, but only in nominal terms. In real 2023 dollars, these differences have declined or stayed about the same depending on the grades considered. Further, the percentage differences have declined over time. Our review of the available literature suggests that capping the differences between officer and enlisted pay could result in reduced military performance and readiness, given the evidence from the civilian sector.

Our review of the comparable worth literature indicates that linking enlisted pay to officer pay based on job content and levels of responsibility would require an extensive job evaluation system that has proven difficult to create in the civilian setting. Setting pay based on factors other than supply and demand conditions, career management, and other principles of military compensation could result in an ineffective and inefficient military compensation system that could hurt the readiness of the force.

CHAPTER 5

Commissioned Officer Basic Pay

Similar to our analysis of junior enlisted basic pay in Chapter 3 and midcareer and senior enlisted basic pay in Chapter 4, our project's support to the 14th QRMC also considered potential adjustments to basic pay for commissioned officers. We summarize that analysis in this chapter.

Background

To assess the need for changes to the officer pay table, we first considered how average RMC compares with the earnings of civilians with similar education and age. As shown in Table 2.5, the weighted average of RMC by officers across YOS is at the 76th percentile of civilian earnings for those with between zero and 20 YOS and those between zero and 30 YOS. Thus, average RMC exceeds the 70th percentile benchmark, as shown in Chapter 2. We also considered aggregate continuation rates, by service, provided to RAND by the DMDC. As shown in Figure 2.4, continuation rates at the eighth year of service have hovered at or above 90 percent. Thus, military pay on average for officers compares favorably with civilian pay, and retention is strong overall.

Some SMEs with whom we spoke raised two main issues pertaining to the officer basic pay table: the link between performance and basic pay was too weak, and the need to facilitate high pay for lateral entrants. We focused on these two issues in developing alternative proposals for modifying the officer basic pay table. We describe what we heard on each issue.

Inadequate Performance Incentives Embedded in the Pay Table

As with the issues we heard regarding midcareer and senior enlisted basic pay, some SMEs expressed concern about the link between performance and basic pay being too weak and that the basic pay increases in the pay table overemphasized additional longevity or YOS compared with promotion or better performance. An additional concern was related to the executive pay limits that cap basic pay for very senior officers.

As we discussed in Chapter 4 in the context of midcareer and senior enlisted pay, we did not validate whether concerns about performance incentives for officers are supported by analysis and data given the challenges of measuring productivity in the military. Instead we focused on whether the officer pay table is structured in a way that is consistent with providing performance incentives, as recommended in the literature, and how it might be improved.

The NDAA for FY 2007 extended the pay table for active and reserve component personnel with 30–40 YOS and raised the cap on basic pay for general and flag officers (O-7 to O-10) as of January 2007 from Executive Level III to Executive Level II in the pay table for senior executive federal employees. As shown in Asch et al. (2016), the Executive Level II cap limited the basic pay of O-10 officers with over 24 YOS at the time of implementation in January 2007. In 2024 the Executive Level II cap limits basic pay of both O-9 and O-10 officers, and the cap is likely to further limit O-8 officer basic pay beginning in 2025. The cap on basic

pay means that promotion to these very senior ranks does not result in a basic pay increase for these senior officers.

Better Facilitate Lateral Entry

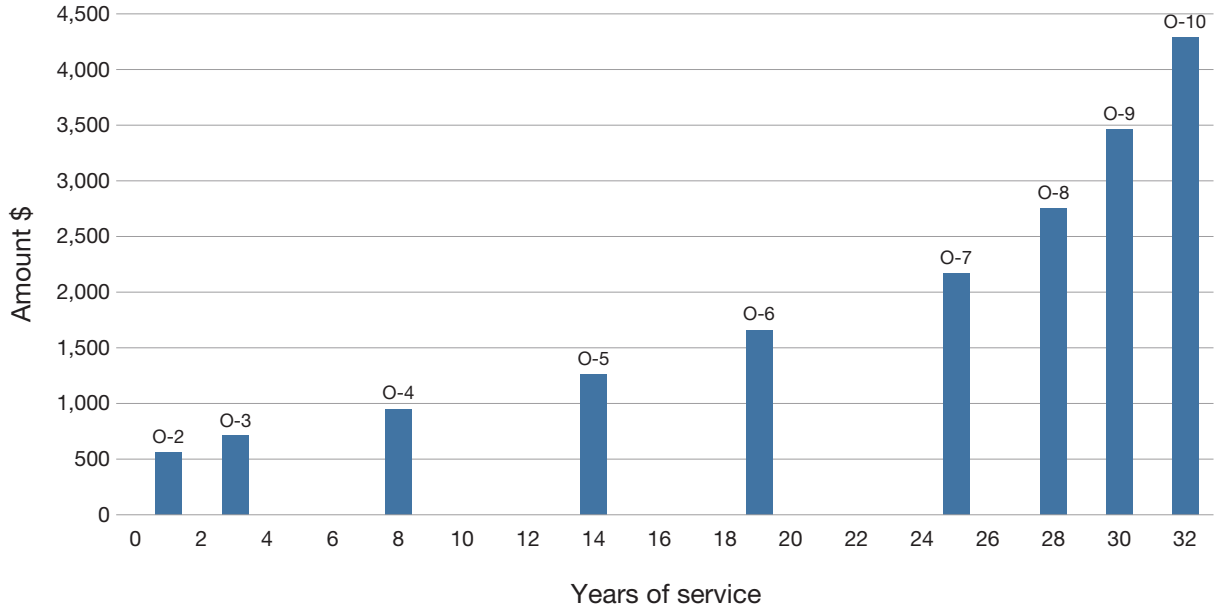
A second issue raised by some SMEs was the need for the basic pay table for officers to better facilitate higher pay for lateral entrants who access the military at a higher grade because they have requisite civilian acquired skills. The 2019 NDAA included reforms to the 1980 Defense Officer Personnel Management Act and specifically authorized the services to grant "constructive credit" for education, as well as for work experience, thereby allowing individuals to enter service at a rank as high as O-6 (colonel or Navy captain). However, these officers would have fewer than two YOS in the basic pay table, resulting in lower basic pay than O-5 and O-6 officers who entered as O-1s and have substantially more than two YOS.

Toward Development of Proposals to Embed Stronger Performance Incentives in the Officer Basic Pay Table

As discussed in detail in Chapter 4 in the context of proposals for midgrade and senior enlisted basic pay, a key insight from the academic literature is that in an organization like the military that promotes from within and is hierarchical in structure, the compensation structure is curved or skewed so that differences in compensation between ranks increase with rank. Figure 5.1 shows this idealized structure for officer compensation focusing on basic pay, just as Figure 4.1 showed it for enlisted personnel. Figure 5.1 shows the increase in monthly basic pay associated with each subsequent officer promotion, assuming the average promotion timing data between 2013–2018. As discussed in the context of Figure 4.1, larger increments in compensation associated with promotion motivate harder work and encourage more talented and better suited

FIGURE 5.1

Hypothetical Example: Increase in Monthly Basic Pay Associated with Commissioned Officer Promotion, by Years of Service



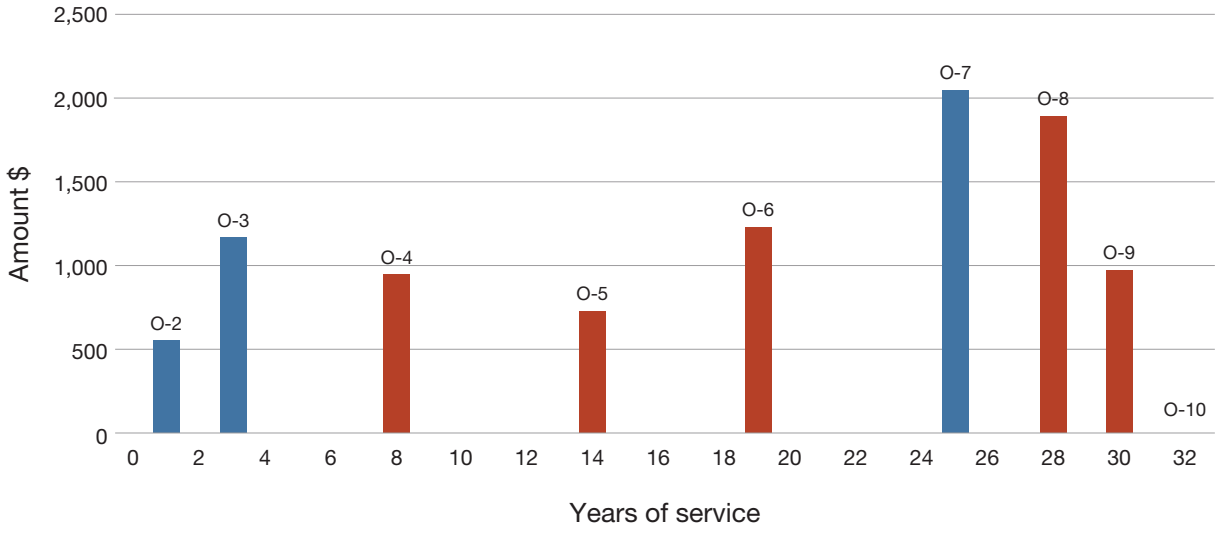
personnel to remain in the organization, thereby sustaining quality of the talent pool from which promotions are made. Further, while Figures 4.1 and 5.1 focus on basic pay, the increase in compensation can occur in other forms of cash compensation, in the form of benefits such as expected retirement benefits, or in the form of nonmonetary benefits. S&I pays are more common among officers than among enlisted members, and the advantage of receiving allowances tax free is larger for officers. Thus, basic pay is generally a relatively smaller share of the compensation package for officers. That said, as the foundational element of the compensation package, it is informative to consider the structure in terms of basic pay.

Figure 5.2 shows how the structure of the commissioned officer basic pay table deviates from the idealized curved structure shown in Figure 5.1. Rather than increasing with higher ranks, the pay increases associated with promotion to O-4 and O-5 *decrease* relative to the previous grade, thereby working counter to a structure that sustains performance incentives across ranks. Specifically, given average DoD enlisted promotion times for 2013–2018, the increase in basic pay for a promotion to O-3 at the third year of service in the 2023 pay table was about $1,161, but it decreased to $945 for a promotion to O-4 and further decreased to about $724 for a promotion to O-5. In addition, the O-6 pay increase is roughly equal to the O-3 increase, rather than larger, and the pay bump associated with promotion to O-8 is less than the bump associated with promotion to O-7. Similarly, the pay increase further decreases with the promotion to O-9, and promotion to O-10 confers no increase in basic pay. The smaller increases associated with promotion for the very senior ranks is driven in large part because of the Executive Level II cap on basic pay. Note that the results regarding the current pay table shown in Figure 5.2 will differ depending on the assumed promotion times. However, using the slower promotion times that prevailed in the early 2000s or the faster promotion times that have prevailed since 2019, we find (in results not shown here) that the current structure continues to deviate from the idealized structure.

The main conclusion is that the basic pay structure for officers does not provide performance incentives for the highest-ranked officers, though other aspects of service, including nonmonetary factors such as expected retirement benefits, could contribute to these incentives.

FIGURE 5.2

Current Officer Pay Table: 2023 Increase in Monthly Basic Pay Associated with Officer Promotion, by Years of Service



NOTE: Tabulations assume average DoD officer promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

Description of the Three Proposals

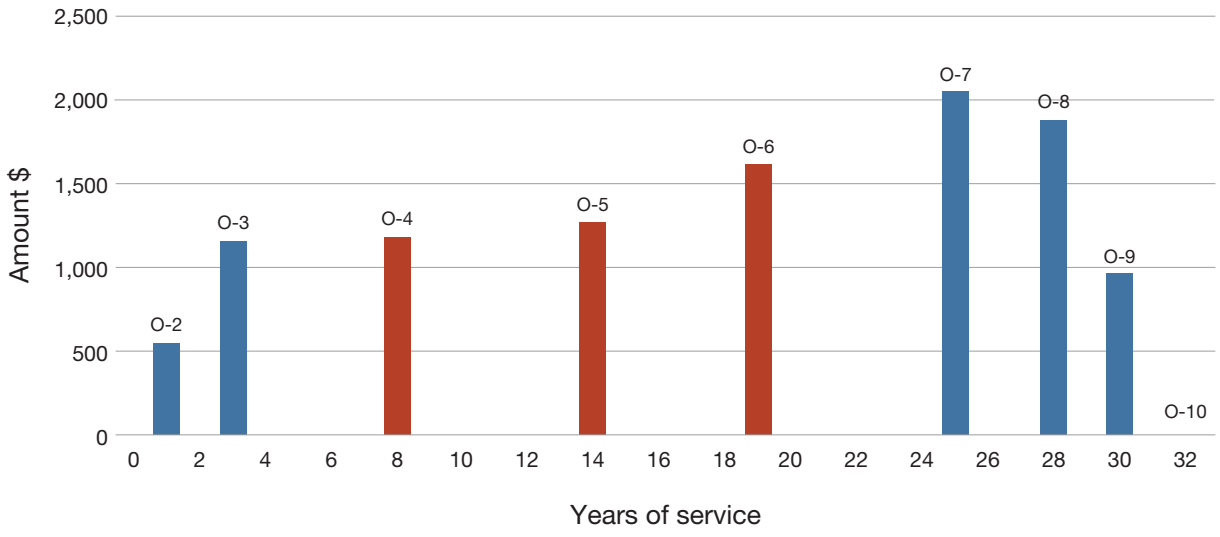
We consider three proposals to restructure the officer pay table to address the issues with the current pay table, summarized in Table 5.1. Proposals 1 and 3 are targeted raises focusing on the O-4 to O-6 pay grades. Proposal 1 would provide a targeted raise between the eighth and 18th YOS for those in grades O-4 through O-6. Proposal 3 would provide a targeted raise for O-5s only. Proposal 2 is the same as Proposal 1, but also replaces the Executive Schedule II (ES-II) cap with the higher Executive Schedule I (ES-I) pay, thereby allowing higher basic pay for O-9s and O-10s. For example, in 2023, ES-II pay was $212,100, while ES-I pay was $235,600.

Proposals 1–3 are illustrated in Figures 5.3–5.5, respectively.[1] Proposal 1 would provide targeted pay increases that would result in promotion increases associated with O-4 and O-5 promotion that would be about equal to the O-3 promotion. The proposal would also provide a higher pay increase associated with O-6 promotion. The proposal would move the current structure closer to the idealized structure that sustains performance incentives.

TABLE 5.1
Proposals to Increase Commissioned Officer Basic Pay

Proposal	Motivation	Notes
1. Targeted raises for O-4 to O-6	Ensure that O-4 and O-5 promotions are at least as valuable as previous promotions, and adjust O-6 to provide larger raise than O-3	Focus changes on the 8th through 18th YOS
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	Same as Proposal 1, plus enable higher pay increases for O-9 and O-10	Also raise cap for Joint Chiefs of Staff and combatant commanders
3. Targeted raise for O-5	Target pay raise for O-5, the midgrade, with the lower pay bump	Focus changes on the 14th through 16th YOS

FIGURE 5.3
Proposal 1, Targeted O-4 Through O-6 Raises: 2023 Increase in Monthly Basic Pay Associated with Officer Promotion, by Years of Service



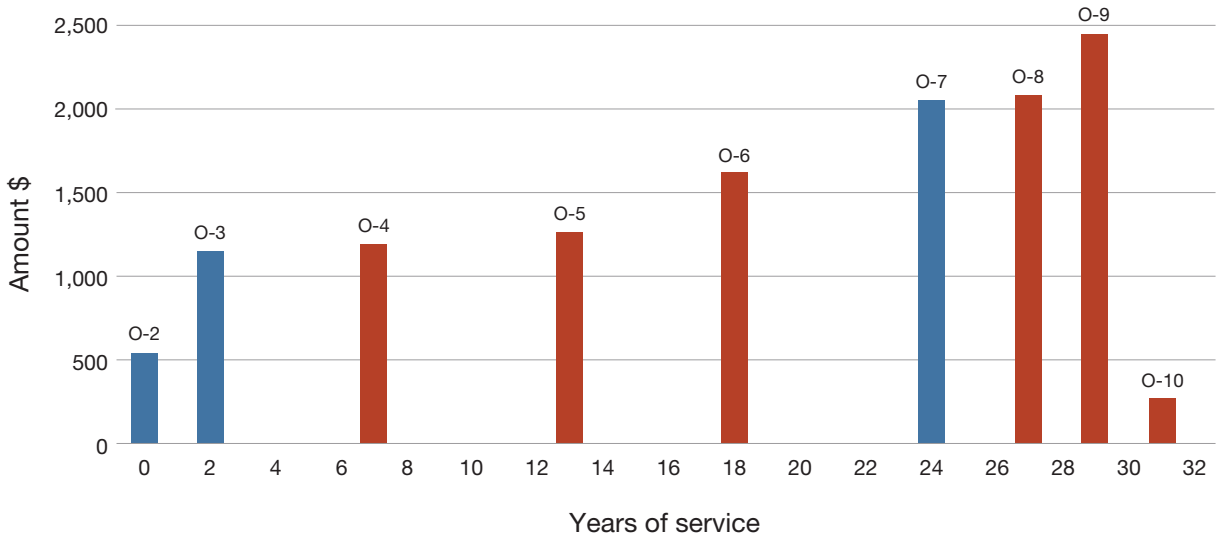
NOTE: Tabulations assume average DoD officer promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

[1] Tables E.2, E.3, and E.4 show the pay tables associated with each proposal.

Proposal 2 includes the targeted raises of Proposal 1, and it also increases the cap on basic pay from ES-II to ES-I, as shown in Figure 5.4. Raising the cap would increase the pay bump associated with the O-8 and O-9 promotions so that they are no longer lower than the pay bump associated with the O-7 promotion. Furthermore, the O-10 promotion would now provide a pay increase, unlike under the current pay table, but the raise would still be relatively small despite the higher cap. Proposal 3 gives a targeted raise only to O-5s and does not address the lower pay bump for O-4 promotion or for the O-8 or O-9 promotions, as shown in Figure 5.5.

FIGURE 5.4

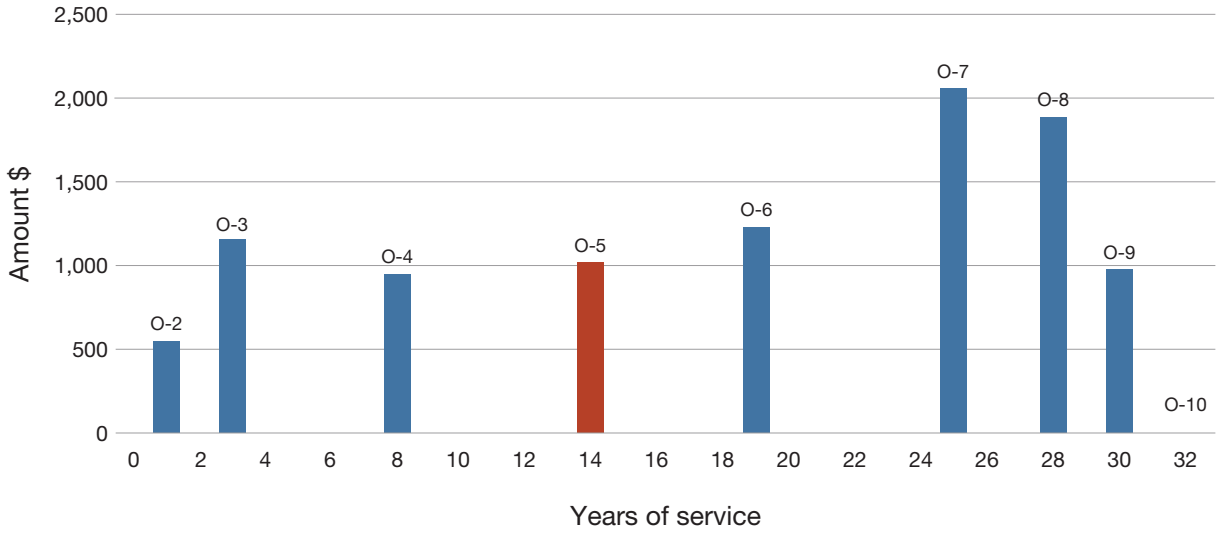
Proposal 2, Targeted O-4 Through O-6 Raises and Executive Schedule I Cap: 2023 Increase in Monthly Basic Pay Associated with Officer Promotion, by Years of Service



NOTE: Tabulations assume average DoD officer promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

FIGURE 5.5

Proposal 3, Targeted O-5 Raise: 2023 Increase in Monthly Basic Pay Associated with Officer Promotion, by Years of Service



NOTE: Tabulations assume average DoD officer promotion times for 2013–2018 based on DMDC tabulations provided to RAND.

Assessment of the Proposals

Similar to the analysis of midcareer and senior enlisted basic pay in Chapter 4, we estimate the steady state retention and cost effects of the three proposals in Table 5.1 using RAND's DRM estimates for officers in each service produced for the 13th QRMC (Asch, Mattock, and Tong, 2020). As with the enlisted analysis, we show results for Army officers, though results for the other services are qualitatively similar and are shown in Appendix E.

The results for officers are shown in Table 5.2. We estimate that in the steady state, an Army officer's accession is expected to provide 10.9 man-years over that officer's career under the baseline current FY 2023 pay table. Per person cost for the officer force in the baseline is estimated to be $152,468 for basic pay and retirement accrual costs. The subsequent rows show the results for each of the three proposals in terms of percentage change relative to the baseline, and the columns also include estimates of our measure of marginal cost of raising pay under each proposal. As in previous chapters, to compute the marginal cost, we take the ratio of percentage increase in cost per service member relative to the baseline over the percentage increase in retention (measured as the percentage increase in expected man-years per accession relative to the baseline). The lower the ratio, the lower the marginal cost estimate and the more efficient the proposal is in terms of producing more retention for a given increase in cost per service member. The final two columns show the change in the annual budgetary cost of basic pay and the retirement accrual cost to the Army and to DoD overall in billions of 2023 dollars.

We find that all three proposals increase retention, as well as cost. Proposal 3 has the most modest effect given that it only provides a targeted raise for O-5s. Man-years per accession are predicted to increase by 0.4 percent, while cost per service member increases by 0.3 percent. The increase in the annual budgetary cost to the Army is predicted to be $5 million; it is $27 million across DoD. Proposal 2 has the largest effects on retention and on cost given that it includes targeted pay raises for O-4s to O-6s and also raises the Executive Schedule cap from Level II to Level I. Retention is estimated to increase by 0.7 percent, while costs per person are expected to increase by 0.5 percent. It also has the largest increase in annual budgetary cost to the Army ($10 million) and to DoD ($45 million). The middle column provides information on the relative efficiency of each proposal. All three proposals are about equally efficient, with our measure of marginal cost ranging from .77 to .81.

TABLE 5.2

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Three Proposals, Army Officers

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Army Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	10.9	$152,468			
1. Targeted raises for O-4 to O-6	0.6%	0.5%	0.77	$0.008	$0.039
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	0.7%	0.5%	0.78	$0.010	$0.045
3. Targeted raise for O-5	0.4%	0.3%	0.81	$0.005	$0.027

SOURCE: Authors' calculations using RAND's DRM.

NOTES: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. Tables E.5, E.7, and E.9 show similar results for the Navy, DAF, and Marines respectively.

Predicted Effects on Retained Ability

We use the DRM parameter estimates from Asch, Mattock, and Tong (2020) to simulate the performance effects of each proposal relative to the baseline. As with the analysis of midcareer and senior enlisted basic pay proposals, we use the method of calibration, since we do not have data on performance. The simulations assume that a service member's promotion speed depends on performance—those who perform better are promoted faster—which, in turn, depends on innate ability. We do not observe ability but treat it as a unitless index. We also assume that those with higher ability have better external civilian opportunities, and we assume that ability differs among military entrants, following a normal distribution with a mean and SD that we assume. The assumed parameters are calibrated or chosen so that we can replicate the observed aggregate retention profile over an officer's career in each service. The details of this methodology are described in Asch, Mattock, and Tong (2020).

Table 5.3 summarizes the results. Under the baseline, we find that the average ability of those in very senior officer grades, O-7 to O-10, is higher than average ability in field grades of O-4 to O-6, 54.5 compared with 39.5, showing that the current system is selective on ability. That is, the current system provides higher-ability officers the incentive to stay and seek advancement while simultaneously weeding out and inducing lower-ability personnel to leave before being promoted. Targeting pay raises to the field grades O-4 to O-6 in Proposals 1–3 increase average ability in these grades, thereby increasing the pool of talent from which senior grade officers are selected and increasing average ability in these grades with the degree varying across proposals. Proposals 1 and 2 increase field grade average ability by an 0.5 percentile in grades O-4 to O-6 relative to the baseline, from 39.5 to 39.9 (a 1-percent change). Proposal 2 increases senior grade average ability by more than Proposal 1 because unlike Proposal 1, Proposal 2 raises pay of O-9s and O-10s by lifting the cap from the ES-II level to the ES-I level. Under Proposal 2, average senior grade ability increases to 55.1. The results for Proposal 3 shows that even a more narrowly targeted raise on O-5 only also increases average ability in the field grades and senior grades, albeit by a relatively smaller amount.

The difference between the mean percentiles of the simulated populations is small but statistically significant. The statistical significance is due to the number of simulated observations (1 million initial accessions followed through, up to 40 YOS). The 0.4 percentile point change from the baseline of 39.5 for the mean ability percentile to 39.9 for field grade officers under Proposals 1 and 2 corresponds to a change of 0.011 SD units. The size of the effect in the simulation (i.e., the change in time to promotion) varies with the change in percentile points and the grade being considered. In this case the 0.011 SD unit change corresponds to an increase in promotion speed to O-4, O-5, and O-6 of from four to 12 days on average—a small effect. However, the simulated effect is larger for the more senior grades, as it varies with the change in percentile points and the grade being considered. For example, a difference of 0.6 percentile points (as we observe for O-7 to O-10 between the baseline scenario and Proposal 2) would correspond to a change of about 0.016 SD units, which translates into the more able service member population being promoted to the senior grades about three weeks faster on average.

TABLE 5.3
Average Ability Percentile by Grade, and Across the Overall Force, Under Three Proposals, Army Officers

Proposal	Overall Force	Field Grade (O-4 to O-6)	Senior Grade (O-7 to O-10)
Baseline	42.5	39.5	54.5
1. Targeted raises for O-4 to O-6	42.7	39.9	54.9
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	42.7	39.9	55.1
3. Targeted raise for O-5	42.6	39.7	54.7

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Tables E.6, E.8, and E.10 give similar results for the Navy, DAF, and Marines respectively.

We can also consider efficiency in terms of ability instead of retention. That is, we can construct an efficiency measure as the ratio of the percentage change in cost to the percentage change in the mean ability percentile for the overall force. For the purpose of illustration, we consider Proposal 2 in Table 5.2, where the change in cost is 0.5 percent. The change in percentile points is 0.47 percent (= (0.427 ÷ 0.425) − 1), and the ratio of the two is 1.06 (= 0.5 ÷ 0.47). Similarly, for Proposal 1 the measure is 0.5 ÷ 0.47 = 1.06, and for Proposal 3 the measure is 0.3 ÷ 0.24 = 1.25. As in the earlier assessment examining retention, Proposals 1 and 2 are the most efficient among the three proposals.

The main finding is that the three proposals would improve retention and ability sorting—inducing higher-ability personnel to stay and be promoted—but would also increase costs; these results are qualitatively similar to our results for midgrade and senior enlisted personnel.

Lateral Entry

As discussed earlier in the chapter, some SMEs expressed concern that the current officer pay table does not accommodate lateral entry because lateral entrants begin with zero YOS in the pay table, earning less basic pay than their peers in the same grade who entered as O-1s. Previous studies, including analyses for the Tenth Quadrennial Review of Military Compensation (10th QRMC) and the 2006 Defense Advisory Committee on Military Compensation, have argued that a time-in-grade pay table would better facilitate lateral entry because lateral entrants would start at higher basic pay.

This finding was verified in Asch et al. (2020), which simulated basic pay over a career for an officer entering the military as an O-4 under the current time-in-service pay table versus an alternative time-in-grade pay table. The finding is replicated in Figure 5.6, which is based on the 2018 basic pay table. The figure shows that,

FIGURE 5.6
Basic Pay with Lateral Entry as an O-4 (in Thousands of Dollars)

SOURCE: Reproduction of Figure 2.10 in Asch et al., 2020.

under a current time-in-service pay table, an O-4 entrant would have a starting monthly basic pay of around $5,000, compared with $6,600 under the time-in-grade pay table proposed in Asch et al. (2020).

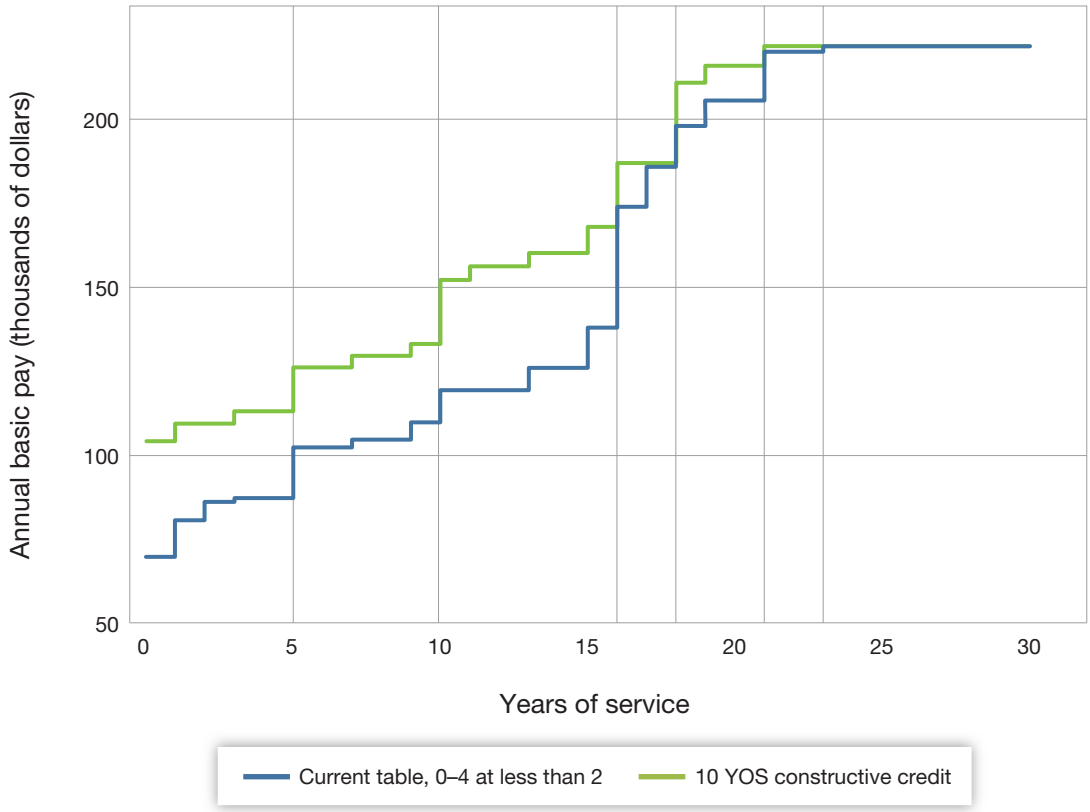
The 10th QRMC did not support the adoption of a time-in-grade table, but to better accommodate higher pay for lateral entrants, it recommended that the current pay table be adjusted by a policy of "constructive credit" whereby the services could credit service members with extra YOS—that is, confer constructive credit—for the purposes of computing basic pay. Constructive credit already exists under DoD policy, but DoD also allows constructive credit in terms of allowing lateral entrants to enter at higher grades, not YOS. Under the 10th QRMC approach, lateral entrants would receive constructive credit for both grade and YOS.

Figure 5.7 replicates simulated basic pay over an officer's career for a lateral entrant under the current time-in-service pay table but under a policy of constructive credit for YOS from Asch et al. (2020, Figure 2.11). The simulation assumes that the O-4 lateral entrant would receive a credit for nine YOS, thereby enabling the O-4 to enter as an O-4 with nine YOS. The figure shows that such a policy would make pay over a career under the current time-in-service pay table virtually identical to pay under a time-in-grade pay table. The implication is that a policy of constructive credit for YOS could enable the services to increase the pay of lateral entrants, thereby making lateral entry into the military more attractive as an option for civilians with skills acquired in the external market.

The results in Figure 5.7 show the effects on pay over a career but do not consider two issues relevant for implementation of the policy. First, lateral entrants who are accorded nine YOS are not necessarily equivalent in taste or ability to service members who have accumulated nine YOS after accessing with zero YOS, as they have not been subject to the same incentives for performance and ability sorting as service members

FIGURE 5.7

Lateral Entry with Constructive Credit for Both Grade and Years of Service



SOURCE: Reproduction of Figure 2.11 in Asch et al., 2020.

who have accumulated nine YOS over time. The services would need to exercise due care in accessing lateral entrants to ensure that their tastes (that is, their personal preferences for active duty military service versus a civilian career) and abilities will be comparable with those of their new peers. Second, the services would need to consider how lateral entrants who receive constructive credit for YOS would be considered for promotion. Lateral entrants might be passed over for promotion due to limited military experience if they are competing with service members who are paid at the same rate but entered the military at zero YOS.

Chapter Summary

While officer retention has been historically strong in recent years, and average RMC among officers compares well relative to civilian pay, our SME discussions raised concerns about the adequacy of performance incentives in the officer pay table especially for midcareer officers and very senior officers. We did not validate whether these concerns are supported by analysis and evidence given the inherent difficulties measuring officer performance. The SMEs also raised concerns about the lower pay for lateral entrants relative to officers in the same grade who entered as O-1s.

We evaluated three proposals to increase performance incentives that target pay raises to midcareer officer grades. One proposal also raises pay for very senior officers by lifting the basic pay cap to the ES-I level. We find that the proposals would increase performance incentives, measured in terms of ability, in the midcareer and senior officer grades, as well as improve retention, with a modest increase in cost. We also find that those proposals that would more broadly target pay raises (Proposals 1 and 2) were more efficient in raising the mean ability of the force as a whole.

We showed that a time-in-grade pay table could increase the attractiveness of lateral entry by raising entry pay for lateral entrants relative to their pay under the current time-in-service pay table. However, we also showed that if the definition of constructive credit were expanded to include YOS, it would enable the services to increase the attractiveness of lateral entry under the current time-in-service pay table and virtually replicate the advantages of a time-in-grade table for lateral entrants.

CHAPTER 6

Setting the Annual Adjustment to Basic Pay

The annual process of adjusting basic pay has important implications for the health of the AVF. There are at least three key goals for the annual basic pay adjustment. First, these adjustments should prevent military pay from falling behind potential earnings opportunities in the civilian labor market, since this could affect both accession and retention into the military and, thus, operational readiness from a manpower perspective (DoD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992b).[1] Second, these adjustments must not allow pay to grow so fast that compensation costs reduce the flexibility of the military to invest in critical equipment, technology, and other resources that also contribute critically to operational readiness. Finally, since military spending accounts for nearly half of discretionary outlays by the U.S. government (Congressional Budget Office [CBO], 2023a), managing compensation for military personnel has significant implications for the efficient use of taxpayer funds and for the broader fiscal health of the nation.

For the last two decades the ECI has been used to provide formal guidance for the annual adjustment of basic pay, but its connection to the pay adjustment process goes back decades earlier. In 1982 a joint services study was conducted to identify the best candidate measure to use in adjusting basic pay (DoD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992b). The ECI—a nationally representative measure of the changes in employer costs of civilian labor computed quarterly by the BLS—was chosen as the best candidate based on the following criteria outlined in the study:

- The ECI covers civilian jobs comparable to around 70 percent of military occupations.
- The ECI was a readily available index for informing the budget process.
- The ECI accurately reflects civilian wage growth.

Despite this finding, the linkage between civilian federal pay and military pay was a barrier to adopting the ECI formally to adjust military pay. The concern was that the guidance provided by the ECI might lead to a divergence between these two pay scales. This concern was alleviated when the ECI was formally adopted as the guide for civilian federal employee pay adjustment in the Federal Employees Pay Comparability Act of 1990. In 1992 the 7th QRMC recommended the use of the ECI in guiding the annual pay adjustment (DoD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992b), but it was not until 2003 that the ECI was formally adopted as the source of guidance for the annual

[1] The 7th QRMC report characterized the needs of an index to adjust military pay to maintain competitiveness with civilian earnings opportunities as follows:

> To manage the annual military pay raise, DoD needs a measure of changes in civilian wages that indicates how much military pay should be adjusted to maintain parity. Ideally, the chosen indicator (index) will have two characteristics:
>
> - It will match as closely as possible the alternative career paths open to individuals choosing, or who have chosen, a military career.
> - It will accurately measure, year by year, the general trend in pay accruing to those alternative civilian career choices (DOD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992b, p. 4-1).

adjustment of military pay.[2] The 7th QRMC also considered alternative sources of guidance for adjusting pay, including the DECI, a measure developed by researchers at RAND in the early 1990s.[3]

This research highlighted large differences in age and education levels between the overall civilian labor force used in creating the ECI and the active duty military force. Specifically, military personnel are, on average, younger, more likely to be male, and have fewer years of education than the overall civilian labor force.[4] The RAND research showed that these differences had important implications for the appropriate level of pay for military personnel and suggested that a substantially lower level of pay increases over the 1980s would have sufficed to keep military pay comparable with civilian labor market opportunities for those serving or considering service in the military. These findings were particularly notable in light of a paradox noted by military planners over that decade: the ECI suggested that military pay had fallen far behind civilian earnings opportunities, but recruiting and retention outcomes over this period were good (Hosek et al., 1992). Ultimately, the 7th QRMC did not recommend the formal adoption of the DECI but recognized the advantages of such an index and recommended that DoD continue to support the development of research on the DECI.

As part of the 13th QRMC, DoD requested further research on the DECI. This research, outlined in Asch et al. (2020), updated the 1990s analysis through 2019 and found further evidence of substantial divergence between the pay adjustment guidance provided by the ECI and the guidance that would have been provided by the DECI over the roughly 25 years since the original work on the DECI. This research found that the DECI and ECI diverged most substantially between roughly 2000 and 2012, with the DECI guidance suggesting much smaller pay increases over this time. Notably, this is the same period when the weighted average enlisted RMC by education and YOS departed sharply from the 70th percentile benchmark, rising from approximately the 70th percentile to the 90th percentile. Over the same period, officer RMC increased from roughly the 66th percentile to the 82nd percentile (Asch et al., 2020).[5]

The recent, rapid uptick in inflation driven by food costs, housing costs, and costs of durable goods (Bennion et al., 2022), as well as recent reports of reported food insecurity among service members (Asch et al., 2023), have all contributed to a renewed interest in whether the ECI continues to be the best source of guidance for making these adjustments in a timely and accurate fashion. To this end, Sec 643 of H.R. 7900 of the FY 2023 NDAA directed DoD to enter into an agreement with a federally funded research and development center to determine whether DoD should continue to use the ECI to adjust basic pay or should instead consider alternative measures, including the DECI (NDAA, 2022). This requirement was incorporated into the work of the 14th QRMC.

In this chapter we address this request by generating new evidence on the adequacy of the ECI in the tumultuous years since the emergence of the COVID-19 pandemic. We also compare the guidance provided by the ECI to counterfactual guidance from alternative candidates, and specifically the DECI, the Consumer Price Index (CPI), and a forecast of the ECI, that could potentially address the time lag introduced by the lengthy legislative process of setting the annual basic pay adjustment. The DECI was specifically named in the 2023 NDAA as an alternative of interest, while the CPI measures inflation and is used as guidance for

[2] Notably, the 7th QRMC also recommended important changes in the structure and calculation of allowances and took the view that the ECI should be used to adjust basic pay so that RMC increased by the amount of the change in the ECI net of adjustments to allowances. At present, the ECI is used to guide basic pay adjustments without respect to changes in total RMC related to housing and other allowances.

[3] The DECI was introduced in Hosek et al., 1992. Hosek, Peterson, and Heilbrunn, 1994, used additional years of data to extend the pay gap analysis between the DECI and ECI in Hosek et al., 1992.

[4] Figures F.1–F.3 in Appendix F show how the age composition, educational attainment, and the sex distribution of active duty members differs from that of the civilian labor force over time.

[5] These percentiles are based on comparisons that use the ADMF for the education weights. Using the SOFS-A data for weights results in slightly lower percentile estimates. See Asch et al., 2020, Figures 3.1–3.4.

major policy decisions including benefit levels in the federal Social Security program. The third alternative is a forecast of the ECI produced by the CBO. We also consider an alternative that involves using an ECI that is computed closer to the time of the military pay raise to reduce the time lag but using an older ECI or an ECI forecast for the purposes of the annual budget process.

To make progress on comparing different measures that could be used to adjust military pay, we developed a common set of criteria that could be applied to each measure considered, drawing from a review of past literature on adjusting military pay—including the report of the 7th QRMC and past RAND research conducted for the 13th QRMC. We use the following set of four criteria to guide our assessment of the relative merit of candidate indexes for adjusting military basic pay:

1. **Accuracy:** Does the index reflect the civilian earnings opportunities of military personnel?
2. **Timeliness:** Does the index reflect the change in civilian earnings between the time the basic pay raise occurs and the same time in the prior year?
3. **Cost-effectiveness:** Is the index an existing measure, or must it be calculated for DoD at an additional cost? And if so, how costly would this process be?
4. **Credibility:** Can the index be produced by a reputable organization? Can it be independently verified, and does it use rigorous methods and underlying data?

In the remainder of the chapter we evaluate the alternatives against these criteria.[6]

The Employment Cost Index

The ECI is a quarterly measure of the change in hourly labor costs to employers over time that has been produced by the BLS since 1975. The ECI uses data on a fixed "basket" of jobs across a variety of occupations and industries to produce a measure of changes in the employer cost of labor that does not reflect the effect of workers moving between jobs (a key source of earning growth for workers) and that includes the employer cost of wages and salaries, as well as the cost of benefits.

The underlying data for the ECI come from the National Compensation Survey, a large-scale survey of compensation costs among businesses and governmental entities conducted by the BLS. The sample of jobs in the ECI is a subset of jobs in this survey, and this sample is held fixed for up to five years to measure the average of a collection of earnings changes within a given job over time. The ECI is a Laspeyres Index, which means that it calculates the average change in labor costs across multiple years using a fixed set of weights—one for each occupation-by-industry grouping—that reflect the share of each of these groupings in the overall economy at a specific baseline period. These shares are held fixed over time; as we discuss below, the BLS updates the ECI employment weights—the mix of jobs used to form the index—approximately once per decade.

[6] We note that the role that annual pay adjustment plays is different from what was intended by the 7th QRMC. The 7th QRMC recommended substantial changes in the structure and calculation of allowances and suggested that the ECI's future role should be to guide annual adjustments to basic pay under this new allowance structure so that overall RMC increased by the amount of the change in the ECI net of annual adjustments to allowances. In other words, the recommendation was that the ECI be used to adjust annual pay as a residual component of RMC to ensure that overall pay including the housing and subsistence allowance, as well as the related tax advantage of these pays, was growing at the rate indicated by the ECI. At present, the ECI is used to guide basic pay adjustments without respect to changes in total RMC related to housing and other allowances. Basic pay, on average, makes up around 60 percent of RMC (and even less for an E-5, for example), so these other components of the total income of a service member are substantial (Congressional Research Service, 2023a and 2023b) and RMC does not include all elements of military compensation. Our assessment of the ECI in this chapter does not consider the broader issue of the appropriate pay adjustment for residual component of RMC.

Formally, the index of changes in earnings, e, in year t, relative to baseline year $t = 0$, where fixed earnings weights, w, is defined as follows:

$$ECI_t = \left[\frac{\sum_i w_{i0} e_{it}}{\sum_i w_{i0} e_{i0}}\right] \times 100.$$

The numerator is the product of the average earnings in the ith occupation-by-industry grouping in period t and the weight assigned to it in the baseline period t_0, summed over all occupation-by-industry groupings. The denominator is computed in a similar way but uses both the weights and the earnings from the baseline period. This ratio is multiplied by 100 to give it a percentage interpretation. Note that only one element, the earnings measure in the numerator, changes over time. The occupation-by-industry weights are held fixed until they are updated (approximately once per decade) to reflect the accrued changes to the composition of employment in the economy. The ECI currently uses weights calculated in 2021 (BLS, 2023).

The BLS produces several specific ECIs that include various subpopulations of the overall labor market (for example, civilian versus government workers) and various components of compensation (for example, total compensation versus only wages and salaries or only benefits). The actual ECI measure used to guide the military pay raise is the measure of the average change in wages and salaries for all private industry workers in Q3 of the year (in other words, the change from July through September of a given year t and July through September of year $t - 1$).

Assessing the ECI Using Our Four Criteria

Accuracy

Due to the nature of its underlying data and by construction, the ECI has a strong claim to be representative of the average change in wage and salary earnings paid in the civilian labor market. Thus, it is highly accurate *if* (to use the language of the 7th QRMC) "the alternative career paths open to individuals choosing, or who have chosen, a military career" (DOD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992b, p. 4-1) are equivalent to the mix of occupations in the entire labor market of private industry occupations (this is the specific ECI index used in setting the annual basic pay adjustment). But multiple aspects of the ECI may limit its accuracy as a guide to the appropriate change in level of military compensation.

Perhaps most important, the ECI measures wage and salary earnings for a population (the civilian labor force) that differs in important respects from the active duty force. Specifically, military service members are, on average, younger, more likely to be male, and they have lower levels of formal educational attainment (we explore these differences in more detail below in our discussion of the DECI). These characteristics have been linked to differences in employment, occupation, and earnings (Cortes and Pan, 2018; Montenovo et al., 2022; von Wachter, 2020).

The accuracy of the ECI in measuring the civilian earnings opportunities of service members or potential service members is also conceptually limited by the fact that it measures earnings from an employer cost perspective (rather than from an employee earnings perspective). The ECI tracks the wages paid for a given job, regardless of which worker occupies that job. Furthermore, if a job is eliminated by one employer in the ECI data sample, another similar job is used to replace it. It may also overrepresent certain jobs and underrepresent others, as the mix of jobs is only updated roughly once per decade (BLS, 2023; Ruser, 2001). The result of these design choices is an index that, in the words of the BLS, "measures the change in the cost of labor, free from the influence of employment shifts among occupations and industries" (BLS, 2024a, p. 3).

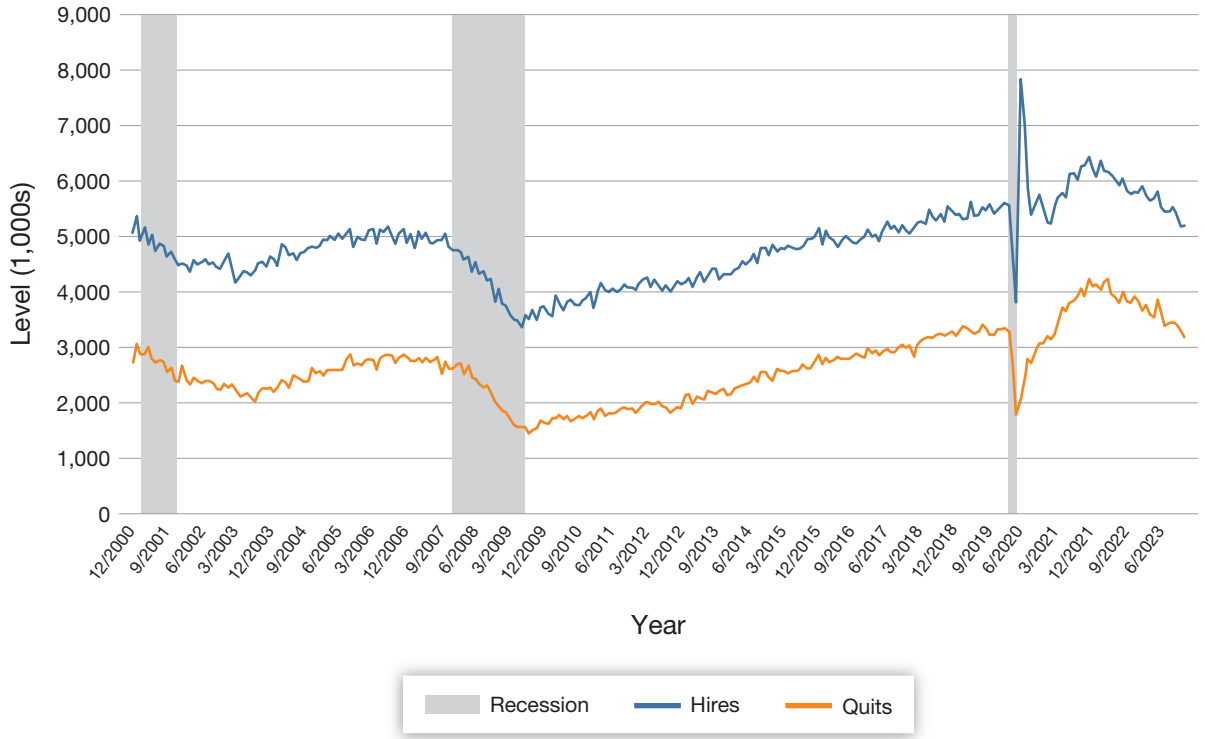
Additionally, the earnings of workers are often substantially influenced by job changes (Hahn et al., 2017; Kochhar, Parker, and Igielnik, 2022; Tanaka, Warren, and Wiczer, 2023). During times of economic growth, both hires and quits tend to rise as workers move to jobs with greater earnings. Conversely, during recessionary periods workers tend to stay in jobs, as the uncertainty of finding other jobs rises. During such times, employer layoffs that target lower-skilled or less experienced workers during a recession—so-called upskilling (Modestino, Shoag, and Ballance, 2020)—can lead observed wages in an occupation to rise in such periods. Figure 6.1 shows the patterns of hires and quits across the three most recent recessions in the United States. This pattern is clearly visible over time—most dramatically during the brief but profound recession associated with the COVID-19 pandemic.

While the ECI is intended to provide guidance and, in many years, the annual basic pay raise is set equal to the change in the ECI, there have been years since 2000 where policymakers opted to provide pay increases that exceeded the change in the ECI, such as the period 2000–2010, and years where they opted to provide a lower pay increase, such as the period 2014–2016. Notably, the basic pay changes that occurred during these periods, such as during 2000–2003 and 2014–2016, more closely resembled the guidance provided by the DECI, which we consider below.

For these reasons, the ECI may not accurately represent the earnings associated with alternative private-sector options for currently serving military personnel. Below we provide further evidence and discussion on the differences between the DECI and the ECI, an index specifically tailored to the average demographics of active duty military personnel that is constructed using data that reflect employee earnings rather than employer costs.

FIGURE 6.1

Changes in Hires and Quits Across Recessions



SOURCE: Adapted from Federal Reserve Bank of St. Louis (undated f, undated g), using BLS data.
NOTE: Data reflect private hires and quits, BLS data series JTS1000HIL and JTS1000QUL.

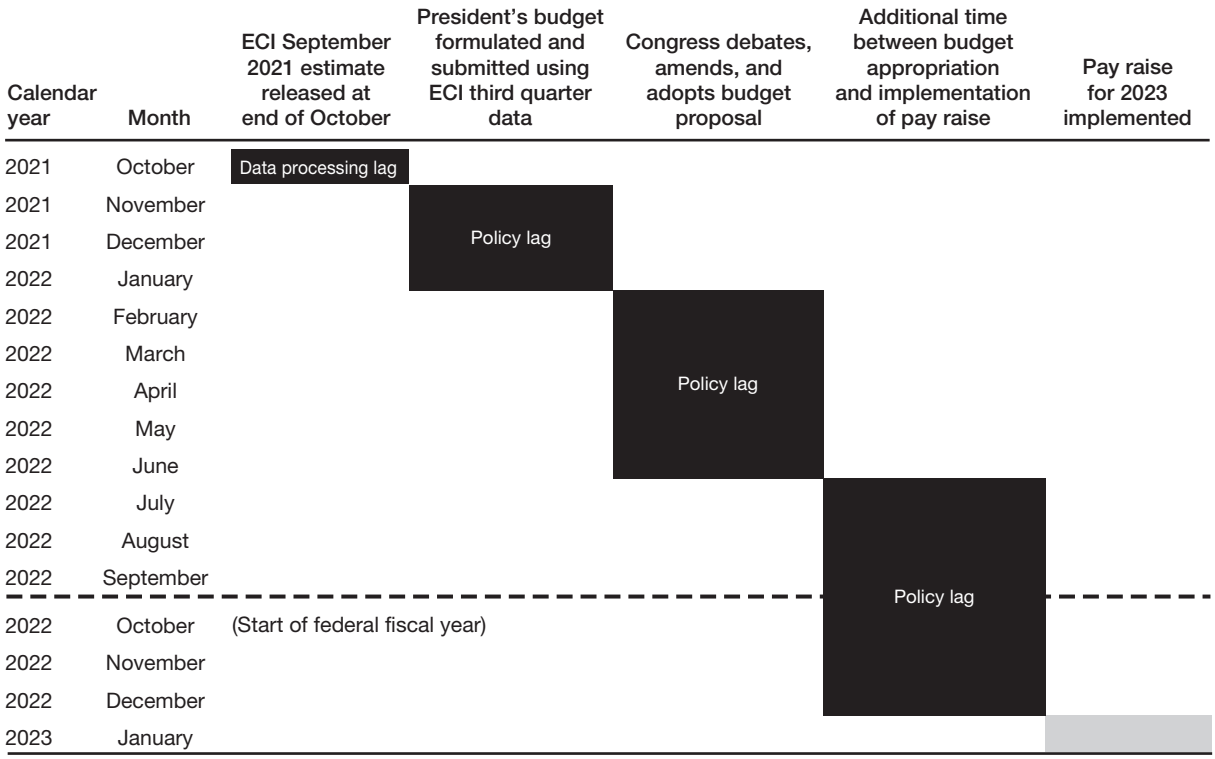
Timeliness

The ECI index is typically released around four weeks after the end of data collection. Thus, the ECI is very timely in terms of any delay after the process of producing the measure itself. However, any candidate measure for adjusting pay faces a second distinct hurdle related to timeliness: the time required by the policy-setting process for the basic pay adjustment.

Figure 6.2 provides an example of the typical policy timeline for setting the annual basic pay adjustment, focusing for simplicity on a hypothetical version of the process for the 2023 pay raise. Collection of the data that inform the pay raise—the ECI measure of the annualized change in wages and salaries for all private-sector workers for Q3 of the year—concludes at the end of September, and the data point summarizing the annualized change in earnings using those data is generally released by the end of October. The President's budget must be submitted to Congress by the beginning of February, and the congressional budget process traditionally runs through June (Aherne, 2023). The final budget resulting from this process is for the fiscal year that begins in October, but the pay raise occurs three months later, at the start of the calendar year. Adding up all this time (in Figure 6.2, the black shaded areas representing the total delay between the end of relevant data collection and the implementation of the related pay raise), the total time lag associated with setting the annual basic pay adjustment is approximately 15 months.

Only one month of this delay is related to producing a measure of earnings changes after data collection is complete. The time required by the current policy-setting process is, far and away, the most important factor in terms of the delay between the data used to guide the basic pay adjustment and its implementation. Notably, 20 percent of this 15-month delay—the three-month period between the beginning of the fiscal year in October and the implementation of the basic pay adjustment in January—is, to the best of our knowledge,

FIGURE 6.2
Example of 15-Month Timeline for Setting Annual Basic Pay Adjustment



SOURCE: Author calculations using data from Aherne, 2023.
NOTE: See Tables E.6, E.8, and E.10.

discretionary. For most of the 1970s and the early 1980s, pay adjustments took effect at the beginning of the fiscal year, in October (Defense Finance and Accounting Service, undated). As we highlight in the policy recommendations at the end of this chapter, implementing pay changes at the beginning of the fiscal year may be the most substantial policy lever available to increase the timeliness of the guidance used to inform the annual basic pay adjustment.

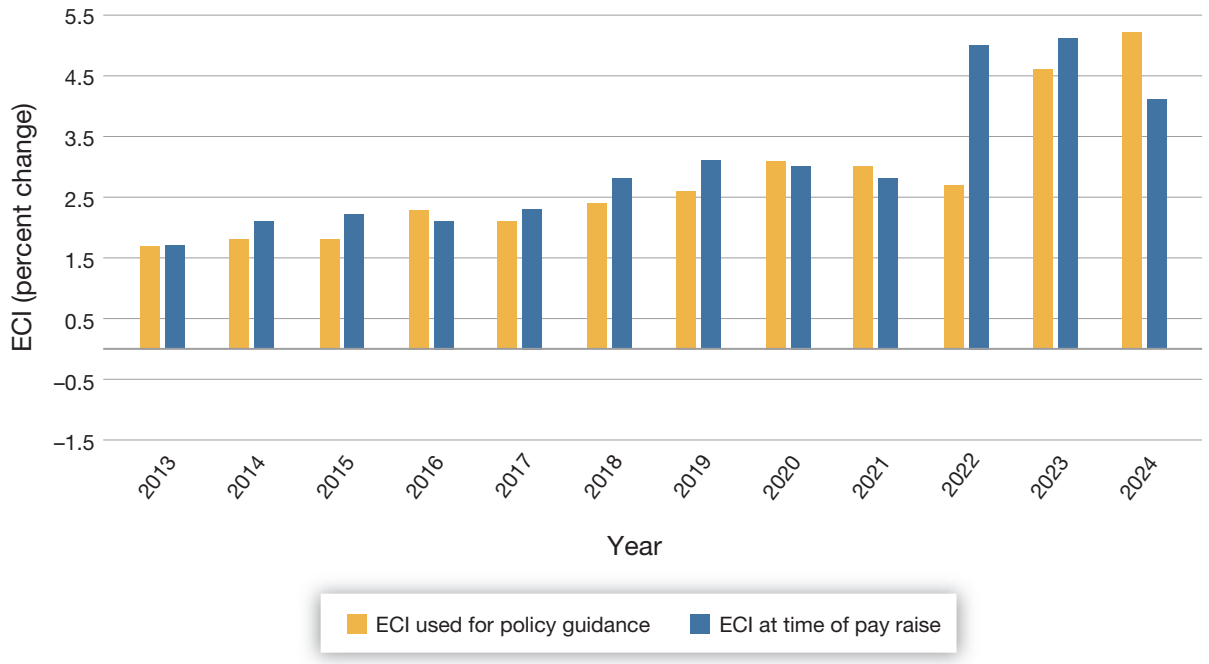
To consider how much the accuracy of the ECI is affected by the policy lag, we compare the difference in the ECI used for policy guidance (the change from Q3 to Q3, as described above) and the ECI that uses data from the quarter that precedes the January pay raise in a given year. In terms of Figure 6.2, this approach involves comparing the ECI from September 2021 with the ECI from December 2022.

Figure 6.3 plots the values of the ECI used for guidance and the actual ECI at the time of the pay raise (five quarters later), side by side, for each of the last 12 years. This comparison shows that the ECI used for guidance diverges from the actual ECI relevant to the military pay raise but that in most years the difference is small relative to the overall level of the basic pay adjustment. The differences between 2012 and 2021 were between 0.0 and 0.5 percentage points (the largest difference over this period was in 2019, when the guidance was 2.6 percent, and the actual ECI five quarters later was 3.1 percent). The direction of this error was that a smaller pay increase was recommended than would have been recommended based on the ECI at the time of the pay raise in seven of the 12 years we consider. In four of the 12 years, the error was toward recommending a larger increase, while in 2013 the recommended change was equal to the ECI immediately preceding the pay increase.

Focusing more specifically on the highly inflationary period since 2022—when both prices and earnings increased rapidly—the difference in the two ECI values induced by the policy lag was more notable. The roughly 14-month lag between the ECI guidance for the 2022 basic pay adjustment and the ECI immediately preceding the pay raise reflects a significant additional increase in potential earnings over

FIGURE 6.3

Comparison of ECI Used for Policy Guidance with Actual ECI at Time of Pay Raise (Five Quarters Later)



SOURCE: Author calculations using data from the BLS.

the period of policymaking for this adjustment: the guidance for the pay raise was 2.3 percentage points (85 percent) lower than the annual earnings increase observed at the time of the pay raise. The magnitude of the error over the policymaking lag moderated substantially in 2023 (the difference is 0.5 percentage points, or 11 percent) and then reversed for the most recent 2024 pay raise, where the guidance recommended a 5.2-percent increase but the actual ECI at the time of the pay raise was only 4.1 percent, a difference of 1.1 percentage points, or 21 percent.

The evidence over the 12 years we consider here suggests that these errors tend to balance out over time. The average difference over the entire 12-year period we consider here is only 0.25 percentage points, or 9 percent of the average annual pay increase over this time of 2.78 percent. Of course, an error in accurate pay guidance of 85 percent below the observed increase in earnings while policy was being made is of obvious importance for service members who, for example, exited the military after 2023 and did not benefit from the subsequent error in the opposite direction during 2024.

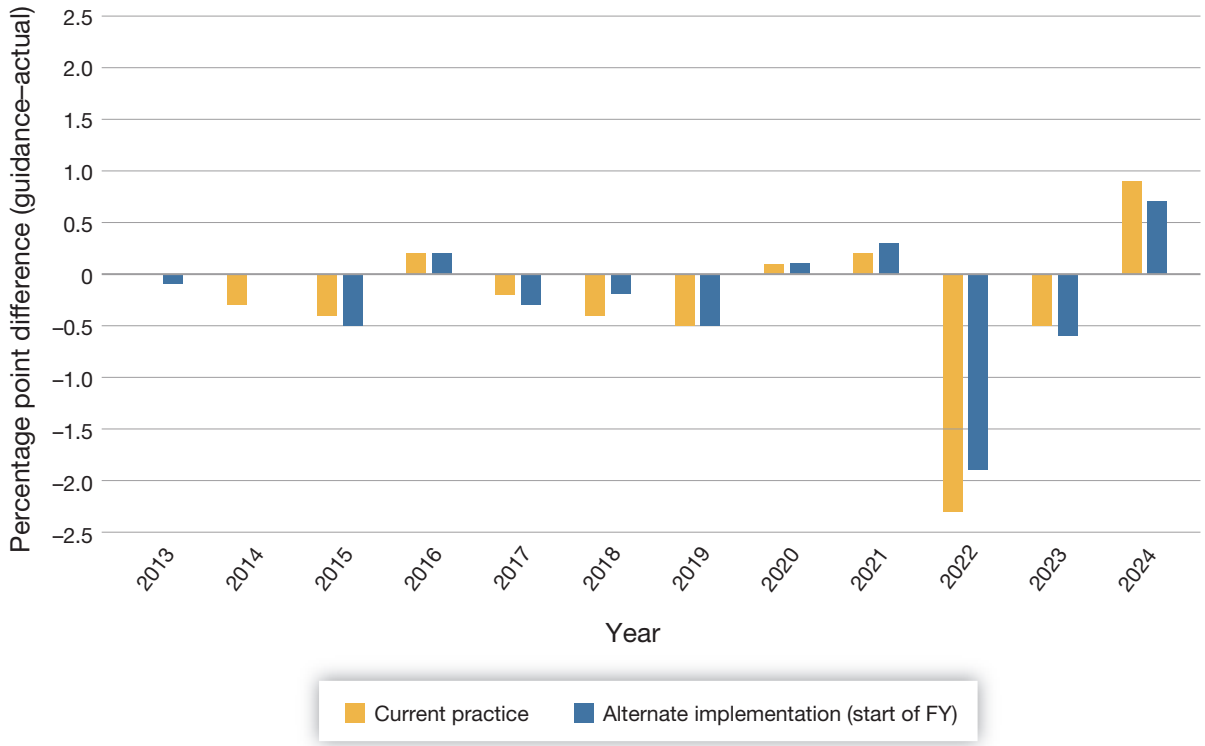
Evidence on the Effect of Shortening the Policy Setting Timeline

Figure 6.4 presents empirical evidence on how much of a difference, in terms of accuracy, shortening the policy lag would have made over the past 12 years. This figure plots the percentage point differences between the ECI used for guidance and, first, the ECI immediately preceding the January basic pay adjustment and, second, the ECI that would immediately precede the basic pay adjustment if it were moved to the beginning of the fiscal year, three months earlier.

In Figure 6.4, the gold bars represent the difference derived from subtracting from the ECI used for guidance for the annual basic pay adjustment the actual value of the ECI obtained immediately prior to the

FIGURE 6.4

Error in ECI Guidance from the Time Lag Under the Current Policy (Pay Raise at the Start of the Calendar Year) and the Alternate Policy (Pay Raise at the Start of the Fiscal Year)



SOURCE: Author calculations using data from the BLS.

implementation of the pay raise at the start of the calendar year, 15 months later. The blue bars represent what this same difference would be if the pay raise were instead implemented at the start of the fiscal year, three months earlier. As can be seen, shortening the time between the ECI guidance and the pay raise does not always lead to a smaller error, but in several years it does. The largest improvement over the status quo was for 2022, when the difference under current policy was –2.3 percentage points, or an 85-percent negative difference, from the actual ECI value of 5 percentage points. This error would have been –1.9 percentage points, or a 70-percent difference, had the basic pay adjustment occurred three months sooner. Overall, over these 12 years, implementing the pay raise earlier would have recommended modestly higher pay on average resulting in an overall error that was 12.5 percent smaller than the cumulative error under current policy.

Incorporating This Time Lag into the Analysis

Unless otherwise indicated, we incorporate this time lag directly into the figures used in this report. Using the example in Figure 6.2, the value of the ECI index for September 2021 will show up in a figure with the time series of ECI index values as *2023*, since it was the guidance used for that year's pay raise. This approach shows the direct connection between the ECI and the annual basic pay adjustment in recent decades by having them track together in time in figures and tables.[7]

Cost-Effectiveness and Credibility

The ECI is produced and disseminated at no cost to DoD. Thus, it is highly cost-effective. With respect to credibility, we are unaware of any meaningful criticisms of the credibility of the ECI. It is a long-running data series produced by the BLS with a history that substantially predates its uses in providing guidance for pay adjustments among the military and federal civilian workforces. Thus, we view the ECI as highly credible.

The Congressional Budget Office's Employment Cost Index Forecast

The use of the ECI or any other candidate measure we consider here is inherently backward-looking. In other words, we are using the recent past to try to inform the trajectory of future civilian earnings opportunities of service members. This suggests there is potential value in considering a forward-looking measure of earnings changes, which involves seeking candidate measures that forecast the future path of civilian earnings opportunities. With this reasoning in mind, we attempted to identify earnings forecast measures that might be accurate enough to alleviate the considerable delay between guidance and policy by accurately predicting what earnings would look like at the time policy was implemented. We were able to identify one such measure: forecasts of the ECI generated by the CBO. The CBO's ECI forecast is part of a larger data series of forecasts of an array of key economic indicators, the "Budget and Economic Outlook and Updates," that is produced for use in the congressional budget process (CBO, undated a).

Assessing the ECI Forecast Using Our Four Criteria

Accuracy

When considering the ECI, we focused on accuracy as it relates to appropriately covering the population of interest and highlighted some important considerations in this regard. These considerations also apply to the ECI forecast. In this case, though, the forecasting exercise itself is an additional important dimension of

[7] In a past report on the topic of the DECI as an alternative index for adjusting military pay (Asch et al., 2020), we adjusted the measures forward only one calendar year (so that, using the same example in Figure 6.2 again, the ECI for September 2021 would have been labeled in a time series figure as *2022*). This may complicate direct comparison with some of the analysis in that report.

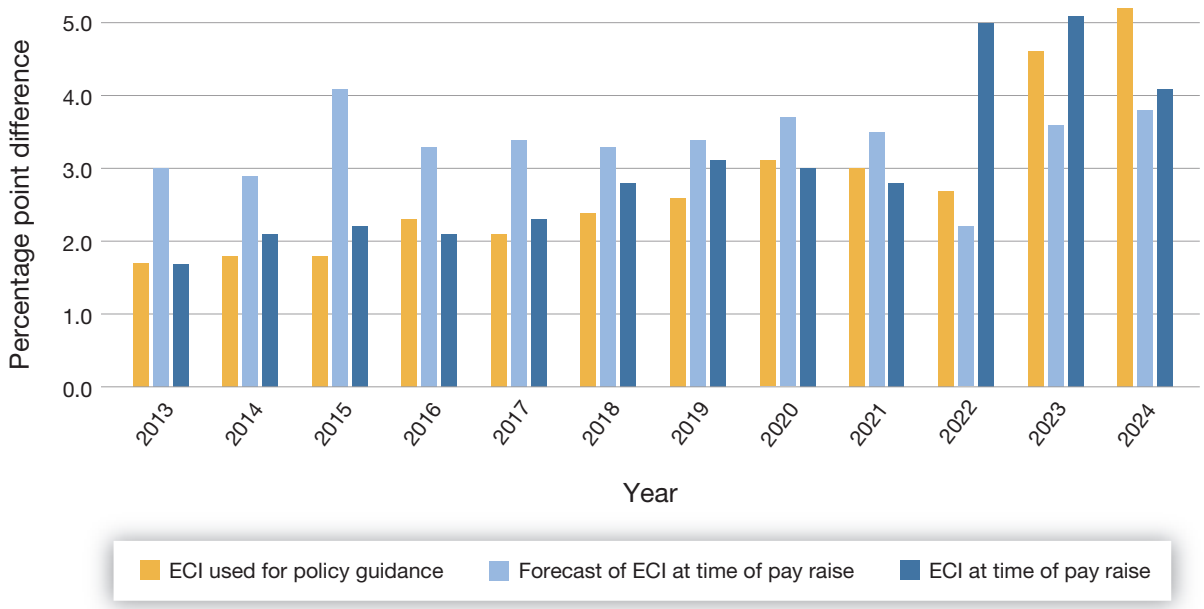
accuracy. In other words, keeping in mind the concerns highlighted above about the accuracy of the ECI, we must additionally ask if the forecasted value of the ECI is an accurate prediction of the actual future value of the ECI. This dimension of accuracy—as it relates to the exercise of forecasting the ECI—is the specific accuracy-related concern of the rest of this subsection.

The CBO's releases of economic indicators that includes the ECI forecast are somewhat irregular, as we discuss in more detail below. For this reason, we assess the accuracy of the ECI forecast for the fourth quarter of the year immediately prior to the January pay raise using the data release date closest to the beginning of the policymaking cycle.[8] In Figure 6.5 we compare the values of the actual ECI currently used (five quarters before the pay raise), the forecasted ECI, and the actual ECI immediately prior to the pay raise taking effect. Figure 6.6 presents these same data as differences, showing the direction and magnitude of the difference between the ECI currently used for guidance minus the actual ECI at the time of the basic pay adjustment and the difference between the forecast ECI and the actual ECI at the time of the basic pay adjustment. A positive value in Figure 6.6 means that the guidance ECI value was larger than the actual ECI, and a negative value means it was smaller.

From 2013 to 2021, the ECI forecast was uniformly higher than the actual ECI at the time of the basic pay adjustment—nearly two times the magnitude in 2015. Should the forecasted ECI have been used for guidance, it would have dramatically elevated basic pay over the relatively more accurate guidance provided by current practice. Overall, during only two years (2019 and 2024) from this 12-year period that we consider

FIGURE 6.5

Comparison of ECI Used for Policy Guidance with Forecasted ECI at Time of Pay Raise and Actual ECI at Time of Pay Raise

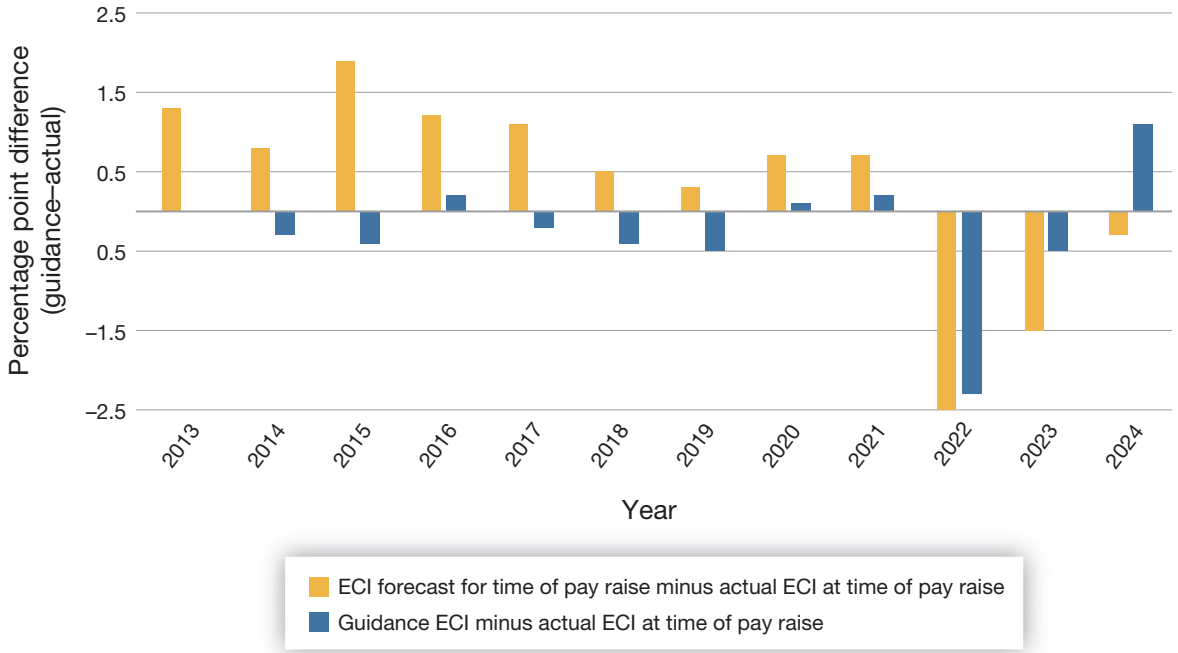


SOURCE: Author calculations using data from the BLS and the CBO.

[8] The specific CBO data release dates we used were August 2011 for the 2013 pay raise (i.e., the fourth quarter forecast for 2012), August 2012 (2014 pay raise), May 2013 (2015 pay raise), August 2014 (2016 pay raise), August 2015 (2017 pay raise), August 2016 (2018 pay raise), June 2017 (2019 pay raise), August 2018 (2020 pay raise), August 2019 (2021 pay raise), September 2020 (2022 pay raise), July 2021 (2023 pay raise), and May 2022 (2024 pay raise). For more on the reasons behind the variation in the dates of the source data, see the discussion of timeliness below.

FIGURE 6.6

Differences over Time Between the Forecasted ECI at Time of Pay Raise or the ECI Used for Guidance and the Actual ECI



SOURCE: Author calculations using data from the BLS and the CBO.

NOTE: Yellow bars are the difference between the light blue and dark blue bars in Figure 6.5. Blue bars are the difference between the yellow bars and the dark blue bars in Figure 6.5.

was the forecasted ECI more accurate (again, in terms of its confluence with the eventual ECI when the pay raise took effect) than the ECI currently used for policy guidance.

We were unable to find documentation outlining the specific approach used by the CBO to develop these ECI forecasts.[9] Thus, we are unable to weigh in on any specific reasons that might lead to the lack of accuracy relative to a lagged value of the actual ECI that we observe in this comparison. Broadly, however, forecasting the economic future is a difficult task.[10] The key implication is that the ECI currently used for guidance would have provided better guidance about the actual ECI at the time of the pay raise than the ECI forecast, suggesting current practice is a better alternative than using the CBO's ECI forecast.

Timeliness

One important issue for the usefulness of this potential alternative index is that these forecasts are released on an irregular schedule over time. For example, in 2020 updated data releases were made in January, March, July, and September; in 2021 data were released in February, March, and July; in 2022 there was only one data release, in May; and in 2023 data were released in May and July only. If the forecasts were all perfectly

[9] On the CBO's website there is a brief discussion of how the CBO produces its economic forecasts: "CBO draws information for its forecasts from ongoing analysis of daily economic events and data, the major commercial forecasting services, consultation with economists both within and outside the federal government, and the advice of the experts on its Panel of Economic Advisers"; CBO, undated b.

[10] For informative overviews of some of the challenges involved and the track record of a variety of forecasts, see De Masi, 1996.

accurate, the timing of data releases would be immaterial, but these estimates, as is the case with many similar forecasts, appear to become much more generalized and less accurate over time.[11] Thus, this irregularity would appear to militate against the ability to use this forecast without, for example, assuring that it could be provided by the CBO on a more regular basis as guidance for the annual basic pay adjustment.

Cost-Effectiveness and Credibility

The CBO's ECI forecasts are produced and disseminated at no cost to DoD. Thus, this index is highly cost-effective. We are unaware of any ex ante criticisms of the credibility of the CBO's economic forecasts as they may bear on issues of impartiality. It may be that a measure produced by an agency of Congress could be considered problematic by some, but the CBO is, to our knowledge, a widely respected and reputable organization, and its analyses are used to assess scores of consequential policy decisions each year. Thus, we view the forecasted ECI as credible.

The Defense Employment Cost Index

One unique alternative approach to providing guidance for the annual adjustment of basic pay is the DECI. The DECI was created by RAND researchers in the early 1990s as an alternative to the ECI for providing guidance on the annual military pay adjustment (Hosek et al., 1992). The DECI is calculated in a manner similar to the ECI, but there are several important differences, primarily related to the data used to construct the index, that distinguish the DECI from the ECI and other potential alternative measures considered in this report.

First, the DECI uses data from a well-established, long-running worker-based survey of earnings and other labor market outcomes: the CPS. This allows the DECI to capture the earnings potential of workers rather than the labor costs of employers. Another important feature of the design of the DECI is that these CPS data are weighted by the demographic composition of the active duty force. These two features, which are both discussed in more detail below, address the key limitations of the ECI highlighted above: the use of employer cost data and the substantial differences in the composition of the overall labor force and the active duty military force.

Construction of the DECI

The earnings data used in the DECI come from a subsample of CPS respondents who provide a self-report of weekly earnings at the current jobs they hold.[12] For each survey respondent, we additionally observe the maximum completed level of education when surveyed and their age, which we use to group respondents into eight age cells. These age groupings are 17–21, 22–26, 27–31, 32–36, 37–41, 42–46, 47–51, and 52 and higher. We also place respondents into one of four groups defining their educational attainment: less than a high

[11] Analyzing the series of ECI forecasts in each CBO data release, there is a clear pattern of the projected value settling into a roughly fixed value within 12 to 18 months into the period of the forecasting and carrying this value forward with little change for the roughly ten subsequent years forecasted in each data release.

[12] The CPS survey uses a longitudinal structure, where individuals at selected addresses are enrolled into the survey and then kept in the sample and surveyed multiple times over a period of 16 months (for four initial months, then the same four months one year later after being left out of monthly surveys for eight months in between). Those who are in their fourth and eighth months in the survey (the last two months of each wave of four consecutive monthly surveys) are referred to as the Outgoing Rotation Group and are asked to provide answers to several additional questions, including questions about earnings from their current jobs. For more on the panel structure of the CPS and other details regarding the CPS program, see Rivera Drew, Flood, and Warren, 2014.

school degree, a high school degree or some college (including an associate's degree), bachelor's degree, and master's degree or greater. Across each of the 32 age-by-education groups, we average the earnings of CPS respondents using the provided CPS sample weights. To generate the most timely measurement of earnings feasible, we use CPS Outgoing Rotation Group survey responses from the months April–September. This sample restriction, along with a few others discussed in more detail in Asch et al. (2020), results in an average sample size of 40,000 individuals per year, with a median cell size of approximately 850 respondents and a mean cell size of roughly 1,400 respondents.

To construct the weights for the active duty population, we use ADMF data maintained by the DMDC. These administrative data cover service, enlisted or officer status, age, and education for all active duty members.

The DECI is a chained Laspeyres Index. This means that, rather than holding employment weights (as well as baseline earnings) fixed at some specified period—which is the case for the ECI—these elements are annually updated so the index compares the change in compensation between the current year and the prior year rather than between the current year and a fixed baseline year.[13] Thus, the DECI for 2023 compares the increase in civilian earnings from 2022 to 2023 and weights these changes using the demographic composition of active duty personnel in 2022.

If we take 2022 to be the baseline year of an analysis, the construction of the DECI ratio for 2022 to 2023 is identical to the ratio used in the ECI. In other words, for earnings, e, and earnings weights, w, the change in the DECI from 2022 to 2023 is defined as:

$$\Delta DECI_{2022-2023} = \left[\frac{\sum_i w_{i,2023} e_{i,2023}}{\sum_i w_{i,2022} e_{i,2022}}\right].$$

However, unlike the ECI, this definition is common to any other pair of years. For example, substitutes this specific pair of years for 2022 and 2023. An index of the DECI for a given year is the product of a chain of year-to-year changes back to any arbitrary baseline year of interest, which is set to 100. Thus, the 2023 DECI using 2019 as the base year is defined in the following way:

$$DECI_{2023} = 100 \times \Delta DECI_{2019-2020} \times \Delta DECI_{2020-2021} \times \Delta DECI_{2021-2022} \times \Delta DECI_{2022-2023}.$$

Background on the History of the DECI in Discussions Regarding Adjusting Military Pay

The potential use of the DECI as the formal guidance to the annual pay increase was considered by the 7th QRMC, but it was ultimately decided to not recommend this role for the index. The final report of the 7th QRMC made the following conclusions about the DECI:

> Although the DECI represents an exciting innovation, we do not support adopting it as the primary index for determining the annual military pay raise at this time. With further refinement, this index may very well assume that role. But for now, we recommend that this index be further developed under the policy guidance of DoD. The following specific questions, at a minimum, must be answered:
>
> - Should the annual pay adjustment of the career force be so heavily influenced by the wage growth of the youth population?
> - Is it appropriate to tie the military pay raise to an index (DECI) that may be less stable than that used by Federal civilians (ECI)?

[13] As mentioned previously, the weights used in ECI are updated every seven to ten years so, in this sense, the ECI too is a chained index that changes infrequently. However, we follow the common usage of the term to refer to an index where the baseline year resets to the prior year annually.

- What are the ramifications of legislating different pay raises for military and Federal civilian workers as a result of using separate indexes?
- Because the DECI lags the ECI by about nine months, can we use the monthly CPS to shorten this delay? If so, how would the different data source affect the DECI's results?

> *The 7th QRMC recommends continuing use of full ECI as the target amount of the annual military pay adjustment. The Office of the Secretary of Defense should underwrite further development of the DECI as a personnel management tool and as a candidate index for future use in the pay adjustment process.* (DOD, Office of the Assistant Secretary of Defense [Force Management and Personnel], 1992b, pp. 2-2–2-3)

As suggested, the DoD has in recent years continued to support ongoing research on the DECI, as has Congress, including the present study. Below we aim to address the points raised here, along with discussion of other aspects of the DECI that may help policymakers effectively decide how best to us this novel index as input to the annual adjustment of basic pay.

Assessing the DECI Using Our Four Criteria

Accuracy

Two key factors distinguish the DECI from the ECI and make it potentially a more accurate measure of the earnings associated with alternative careers most relevant to active duty service members. First, the DECI uses CPS data to inform estimates of earnings. The CPS began as a survey of unemployment under the Works Progress Administration during the Great Depression before it was moved to the U.S. Census Bureau in the early 1940s (U.S. Census Bureau, 2006). As a primary data source used in the calculation of national unemployment and LFP measures, as well as a key data source on national demographics, population mobility, earnings, and other social and economic indicators, CPS data play a major role in policymaking. For this reason, we view the CPS data as arguably the most accurate source of high-frequency data for measuring employee earnings changes.

The CPS is a nationally representative survey of households that typically collects data from around 130,000 individuals per month. Approximately one-fourth of surveyed households provide detailed information on their earnings in the week prior to being surveyed. The survey uses an address-based sampling frame to contact individuals regardless of where or whether they are working and then follows them over time, regardless of whether or where they are employed. To focus on earnings potential conditional on ability and willingness to work full-time, we restrict the CPS sample to full-time workers—those who report usually working 35 or more hours per week.

Second, the DECI uses administrative data on the composition of the active duty force in terms of age, educational attainment, and, as appropriate, other characteristics (which can include gender, officer or enlisted status, or potentially other observable characteristics) to weight the sample of civilian earners in the CPS so that they more accurately reflect the makeup of active duty military personnel. We use eight multi-year age groupings, four educational attainment groupings, and gender to generate a set of 64 weights, one for each age-by-education-by-gender cell.[14] As we will demonstrate, this relatively basic division of workers

[14] In the main body of this report, we use a DECI measure that includes gender weighting because of evidence that, similar to occupational differences across age and education groups, there are occupational differences across gender, and accounting for this factor can help the DECI better describe the most relevant earnings trajectories over time for active duty personnel (Alonso-Villar, Del Rio, and Gradin, 2012; Pearlman, 2018). However, in practice the DECI does not differ in a substantial way over a longer time period according to whether gender is included or excluded. For a comparison showing that—aside from the years 2011 and 2012—DECIs that include or exclude gender vary little from each other between 2000 and 2023, see Figure F.5. For more discussion about the considerations around including or excluding gender from the DECI's construction, see Asch et al., 2020, Chapter 4. Figure F.4 in Appendix F shows DECI over time including and excluding gender in weighting.

according to just three demographic characteristics generates a significantly different measure of the growth rate of earnings over time than the one provided by the ECI.

Since these weights are updated annually (unlike the ECI weights, which are updated every seven to ten years), each year's earnings are weighted by the demographic composition of the prior year's active duty force. This means that the DECI reflects not only changes in the earnings of civilian workers as they experience job changes over time (for various reasons) but also any changes in the makeup of the active duty force that would inform the most relevant path of potential civilian earnings over time for these members.

The design of the DECI also allows for the creation of subgroup specific DECIs, such as for enlisted members or officers, specific services or occupational specialties, and other subgroups of potential policy interest. This flexibility not only makes the DECI a good candidate for setting the annual pay raise but also allows the DECI framework to be a useful tool in considering other aspects of military compensation, such as enlistment or reenlistment bonuses. For example, let us suppose that subgroup analyses indicated that the civilian labor market opportunities for young, non-college-educated workers—the age group most representative of those at the decision point of whether to enlist for the first time in the military—experienced a larger increase in earnings than indicated by the overall DECI. Such evidence could be a useful signal that an enlistment bonus might be complementary to the overall basic pay adjustment to compensate for this asymmetric change in compensation levels across the labor market.[15]

Differences in the Demographic Composition of the Active Duty Force and the Civilian Labor Force

The age, educational attainment, and gender composition of the active duty force and the civilian labor force have substantial differences. In terms of age, between 1982 and 2023, 17- to 21-year-olds have made up between 18 and 31 percent of the active duty force, while their share in the civilian labor force varied between 4 and 9 percent. Conversely, service members ages 37 and higher made up between 11 and 16 percent of the active duty force, while they made up between 44 and 59 percent of the civilian labor force. As for educational attainment, the share of service members with high school degrees as their highest educational credentials ranged between 62 and 71 percent, while the same range in the civilian labor force was from 25 to 42 percent. Finally, in terms of sex, women made up between 40 and 43 percent of the labor force over this period while making up between 11 and 19 percent of the active duty force. These differences are shown in Figures F.1–Figure F.3 in Appendix F.

Figures F.1–F.3 show the evolution of these demographic trends over time, but the summary above makes clear that there are large differences between the demographic composition of the military and the civilian labor force. It is likely that that the alternative average civilian labor market opportunities for active duty personnel differ from the opportunities for the broader civilian labor force, on which the ECI is based.

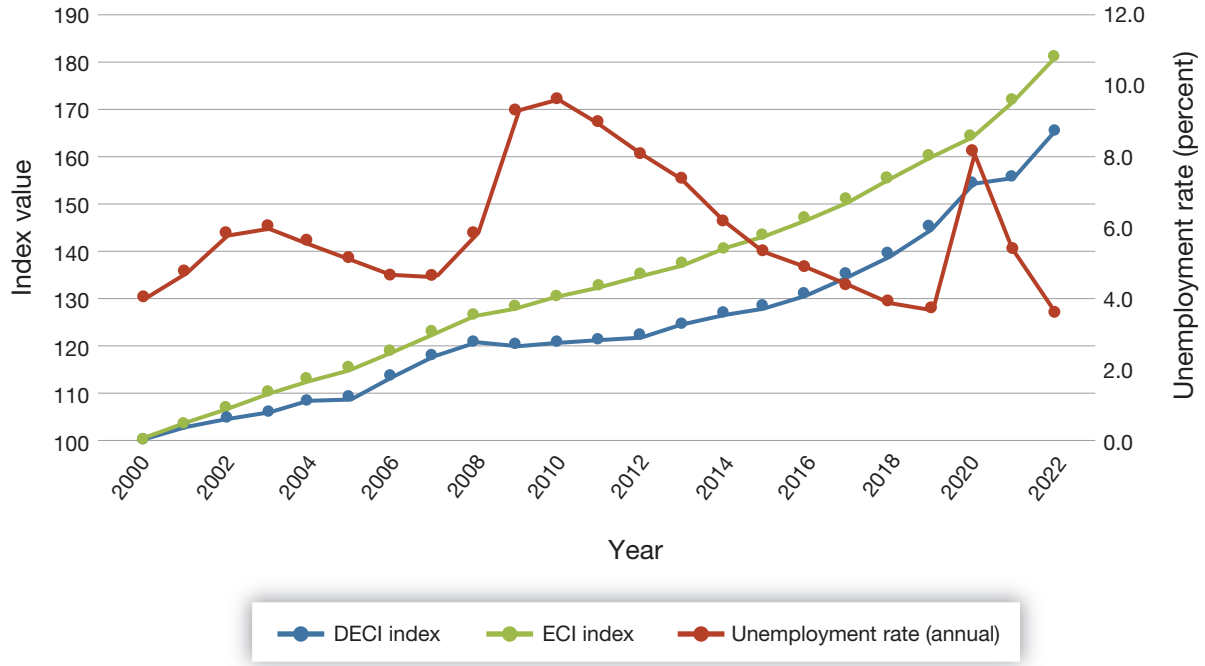
The DECI Reflects Earnings Changes Related to Job Switching and Changes in Unemployment

As we previously noted, since it is designed to reflect the labor costs of employers, the ECI does not reflect potentially important factors in the labor market that bear on the realized earnings of civilian workers. Specifically, the ECI uses the earnings from a fixed set of jobs; thus, if during a recessionary period a job in the sample is lost through a layoff, it is replaced with a similar existing job. Relatedly, if new jobs are created during expansionary periods that offer higher wages to attract workers, these new jobs will not enter the sample except through the periodic adjustment of the ECI weights. These two forces (layoffs and job creation) are a key source of earnings changes for workers, and both of these sources of earnings changes in the civilian labor market likely influence the decisions of individuals to enlist in and/or remain in the military over time and should arguably be reflected in the guidance for the annual basic pay adjustment.

Figure 6.7 shows how the DECI and the ECI differ over the last 23 years in terms of their relationship with a key labor market indicator, the unemployment rate. Both the DECI and the ECI use 2000 as the baseline

[15] We note that this is precisely what occurred in the aftermath of the COVID-19 pandemic; Autor, Dube, and McGrew, 2023.

FIGURE 6.7
Relationship Between the ECI, the DECI, and the Unemployment Rate



SOURCE: Author calculations based on unemployment data from the BLS (undated c); CPS data from the Integrated Public Use Microdata Series (IPUMS; Flood et al., 2023); and DMDC data.

NOTE: We do not incorporate the 15-month policy lag into this figure by postdating the DECI and ECI measures, as discussed in the main text, since this comparison is intended to assess the responsiveness of these indexes to changes in the contemporaneous unemployment rate.

year; this index value, beginning at 100 in the year 2000, is shown on the lefthand *y*-axis of the figure. The unemployment rate, which fluctuated between 3.6 and 9.6 percent on an annualized basis over this period, is shown on the right-hand *y*-axis.

Multiple shifts in the unemployment rate over this time highlight the differences in the lagged response in these two earnings indexes. From 2000 to 2003, the unemployment rate increased from 4 percent to 6 percent. From 2001 to 2004 the ECI increased by 9.0 percent, while the DECI only increased by 4.4 percent, more accurately reflecting the decreased earnings opportunities associated with a period when the unemployment rate increased by 50 percent.[16] Conversely, from 2003 to 2006, as the unemployment rate declined back to 4.6 percent (a 20-percent decline), the ECI increased by 8.7 percent, while the DECI increased by 10.6 percent, reflecting the increased opportunities for earnings growth as employers had to compete more for workers in a period of low unemployment.

This difference in the relationship between the unemployment rate and the DECI versus the ECI was even more prominent during the large spike in unemployment during the Great Recession of 2007–2009, when the unemployment rate more than doubled, from 4.6 in 2007 to 9.6 by 2010. The unemployment rate did not return to the 2007 level until more than a decade later, in 2017. Over this period (using the same one-year lag as before—thus, 2008–2018) the ECI increased by 22.9 percent, while the DECI increased by 15.4 percent, reflecting the reduced civilian earnings opportunities associated with this period of higher unemployment.

[16] These calculations are based on the simple formula (using the ECI as the example) $ECI\ \%\ change = \frac{ECI_{t1} - ECI_{t0}}{ECI_{t0}} \times 100$. Thus, for example, the first calculation is ((112.9 – 103.6) 103.6) × 100 = 9.0.

Note that from around 2017 to 2020 the DECI also began to more accurately reflect the long, slow decline in unemployment by increasing more rapidly than the ECI.

Finally, focusing on the period of the COVID-19 pandemic, the DECI incorporated the major shock to earnings experienced during the unemployment spike of 2020. It flattened out from 2020 to 2021, followed by a sharper increase from 2021 to 2022, reflecting the rapid return a of much lower level of unemployment in 2021.

Overall, these patterns suggest that the DECI more accurately characterizes the labor market opportunities of civilians from a perspective of potential earnings rather than from the employer labor cost perspective, which is characterized accurately by the ECI.

How Would Use of the DECI Have Affected Guidance on Adjusting Basic Pay in Recent Decades?

While the conceptual properties of the DECI are important to consider in judging its feasibility as a potential alternative to the ECI, what is arguably most important is how the guidance provided by the DECI would have differed over time from the guidance provided by the ECI. We previewed these differences in Figure 6.7, but in Figure 6.8 we add a comparable index of the path of actual basic pay adjustments (which we call the basic pay index, or BPI), since annual adjustments have diverged from ECI guidance somewhat frequently over the last two decades.[17]

Figure 6.8 shows a few notable patterns. First, over the full 24 years, the growth in basic pay as shown by the BPI has been higher than the ECI, suggesting that the guidance provided by the ECI has not always been heeded. The second important pattern is that the DECI has tended to follow multiple discretionary deviations from the ECI decided on by policymakers fairly closely over time. For example, over the period 2008–2009, when the annual basic pay adjustment equaled ECI plus 0.5 percent, the DECI would have suggested a higher increase than the ECI guidance (4.1 percent versus 3.0 percent in 2008, and 3.7 percent versus 3.4 percent in 2009). Similarly, when the annual basic pay adjustment was below the ECI from 2014 through 2016, the DECI had been trending lower than the ECI for the prior five years.

Perhaps most important, during 2021 and 2022, when the labor market and supply chain disruptions of the COVID-19 pandemic raised the issue of pay falling behind in terms of costs of living for current service members and in terms of contributing to recruiting deficits (Gould, 2022; Kheel, 2022), the DECI was more quickly capturing upward trends in employee earnings that were reflected in considerably higher levels of change in the DECI than the ECI (4.2 percent versus 3.0 percent in 2021, and 6.3 percent versus 2.7 percent in 2022). In the most recent year in our data, 2023, the DECI was much lower than the ECI (0.8 percent versus 4.6 percent). But over the three years since 2020, the DECI would have still led to slightly higher pay relative to the ECI guidance and, notably, the largest increases would have been more front-loaded, taking place during the two years with the highest levels of inflation (4.7 and 8.0 percent, respectively).[18]

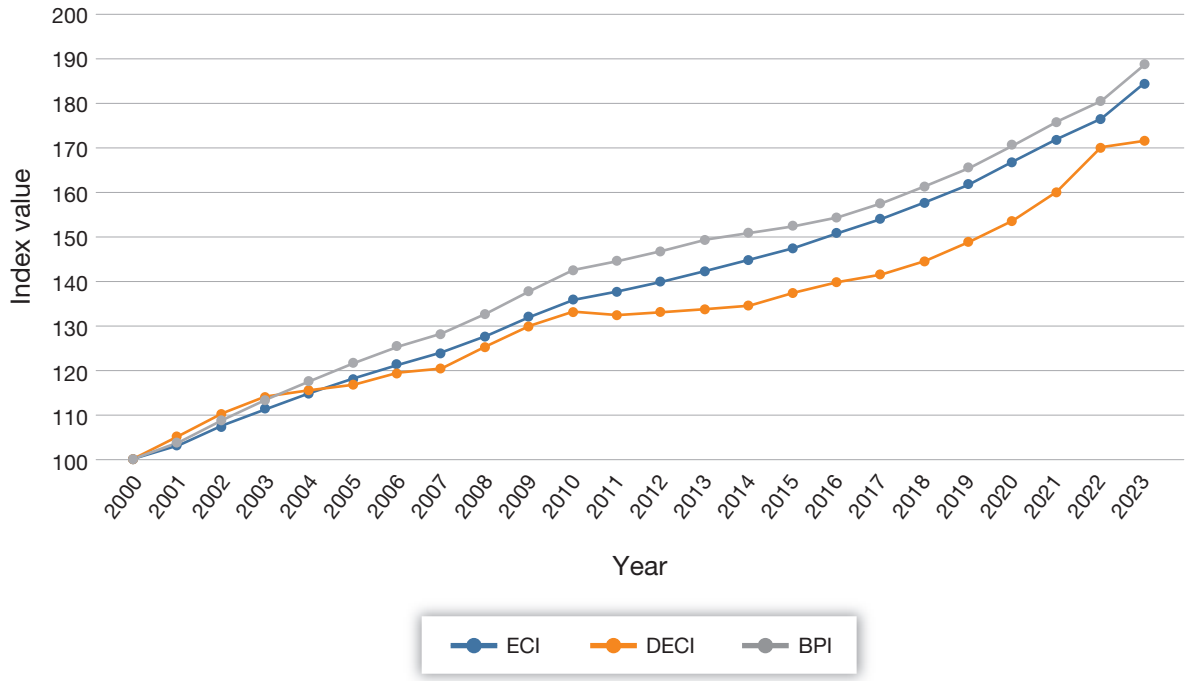
It is also notable that the DECI guidance would have resulted in a lower level of overall pay increase over 2000–2023, the full time period shown in Figure 6.8. From 2000 to 2010, a span of time in which the weighted average of enlisted RMC by education and YOS increased from the 72nd to the 92nd percentile of civilian pay, using ADMF weights (Asch et al., 2020) the DECI was 7 percent lower than the BPI (which reflected pay increases based on a combination of ECI guidance and discretionary variation from that guidance). This gap widened to 12 percent by 2014 and shrunk to 10 percent by 2023. The broad takeaway, though, is that the DECI would have set a lower trajectory of pay growth over more than two decades and, was the guidance

[17] Also, unlike Figure 6.7, Figure 6.8 *does* incorporate the policy-setting lag as discussed earlier so that, for example, the ECI from Q3 2021 is shown here as the change in the ECI for 2023, or the time that the actual pay raise it provided guidance for went into effect. Because the value of each index shown in Figure 6.8 depends on the base year, we show the path of the ECI, DECI, and BPI using 2010 as the baseline year in Figure F.4 in Appendix F.

[18] These numbers are from the annualized rate of change from a year earlier in the BLS's CPI-U data series.

FIGURE 6.8

Changes over Time in the ECI, DECI, and BPI Using 2000 as the Baseline Year



SOURCE: Author calculations from CPS data from IPUMS (Flood et al., 2023), DMDC data, and data on basic pay increases from the Congressional Research Service (CRS, 2023a).

NOTE: In this and similar figures comparing earnings indexes with the BPI, we lag the earnings index measure by two years to match the 15-month policy-setting timeline so that, for example, the ECI from September 2019 to September 2020 is used to guide the pay increase implemented ultimately in January 2022. We use the same approach with the DECI.

followed during this period, the magnitude of the increase of RMC to far above the 70th percentile benchmark would have been attenuated.[19]

Timeliness

In the early 1990s, when the DECI was originally developed (Hosek et al., 1992), timely data access was a significant challenge. Three decades later, these issues have been resolved by advances in computing power and connectivity. The BLS typically makes CPS microdata available through its website within a week of the completion of data collection. Furthermore, these data are quickly integrated into a well-designed CPS data repository, IPUMS (Flood et al., 2023), run by the University of Minnesota. IPUMS allows users to easily create a customized CPS data extract with most variables harmonized across time. The IPUMS site maintains a record of all requests from each data user, so that generating a new data extract only requires quickly updating a prior data request. These data are delivered over the internet along with data dictionaries compatible with most common statistical software packages. IPUMS data are typically ready for use in seven to ten days after the data are first made available by the BLS, so data are available through this conduit around three weeks following the end of the relevant survey month.

This data access allows for the generation of a DECI using monthly CPS data collected through the end of September by late October, a timeliness that closely matches that of the ECI. As discussed above, however,

[19] In Figure F.4 we show the same results as in figure 6.8, but using 2010 as the baseline year. Again, the growth of basic pay if following guidance from the DECI would have been lower over this entire period.

the potential for error in guidance introduced by the policy-setting timeline would apply to the DECI just as it does to the ECI.

Cost-Effectiveness

The ECI has the advantage of being generated on a regular basis by another federal agency at no cost to DoD, but DECI would need to be generated by DoD or a contractor. However, generating the DECI does not require any data collection, as the CPS and military administrative data are already collected at no direct or additional costs to DoD. Additionally, generating a DECI annually using code already published in Asch et al. (2020) could be accomplished by any trained programmer using any powerful modern laptop computer. For these reasons, we view the DECI as highly cost-effective.

Credibility

The annual DECI measure could be generated using the in-house computing resources and personnel across organizations within DoD, such as the OPA in OUSD(P&R) or the Office of Cost Assessment and Program Evaluation. This office already provides independent analytics for the Secretary of Defense, so the use of the office in computing the DECI would arguably be a credible approach. Furthermore, making available the methodology and computer code used to generate the DECI (as has already been done) would further help to assure that it is a credible and transparent measure for guiding the annual basic pay adjustment.

The Consumer Price Index

The CPI is the source of official inflation measures for the United States and is used to govern adjustments to payments and other obligations in a wide variety of contract and policy settings (Rippy, 2014). Perhaps most important, since 1975 the CPI has been used as the source of annual cost of living adjustments to benefit levels in the federal Social Security program (Social Security Administration, undated).

The potential to use input from the CPI to guide the annual basic pay adjustment came up on multiple occasions in our discussions with DoD SMEs for this study. Our impression is that interest in the CPI is primarily or entirely motivated by the notion that it would potentially serve as a better safeguard against pay falling behind rising prices than the ECI has in the tumultuous years since the emergence of the COVID-19 pandemic.

In the following sections, we consider the CPI through the lens of the same four criteria we have used for the other measures covered in this chapter. We ultimately conclude that both theory and evidence strongly suggest that the CPI is not a viable candidate for guiding the annual basic pay adjustment.

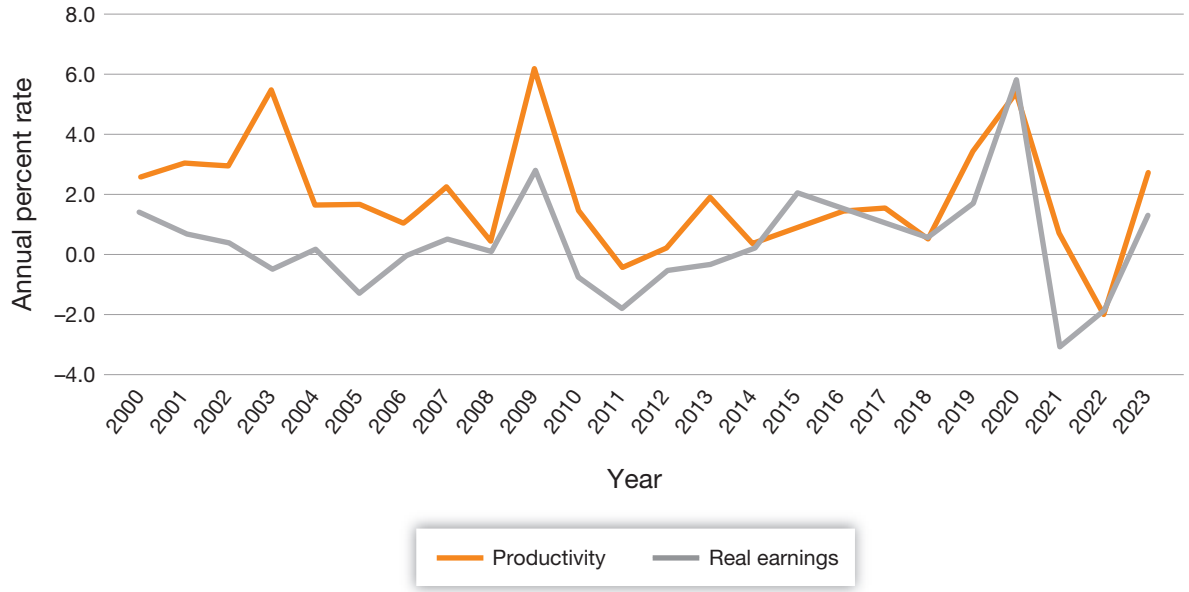
Accuracy

There are two important points to make about the accuracy of the CPI in terms of reflecting the path of civilian earnings relevant to people considering joining the military or continuing in service. The first one is conceptual and hinges on how prices and wages are related to one another. The second one is empirical and relates to how the CPI has differed from the path of basic pay and the ECI over time. We cover each of these issues in turn.

Economic Theory Posits That Earnings Growth Is Driven by Increases in Productivity

Basic economic theory argues that economic output is split between the contributions of labor and capital and that real wage gains are primarily related to increases in the productivity of labor (see, for example, Smithies, 1960). Figure 6.9 plots this relationship since 2000 by showing the annual percentage change in productivity (output per worker per hour) and the annual percentage change in median real earnings.

FIGURE 6.9
Comparison of Changes in Productivity and Real Earnings over Time



SOURCE: Adapted from Federal Reserve Bank of St. Louis, (undated e), using BLS data.

Though this pattern is not present in all years (for example, the early 2000s), overall there is a clear, persistent relationship between these two measures, consistent with theory that says when productivity increases, real wages should increase as well.

Real wages are defined as changes in nominal wages (wages in actual dollars in each period) adjusted by the change in prices. Therefore, real wages increase when the growth of nominal wages is faster than the growth of prices. This was the case for 15 of the 24 years in the time series in Figure 6.9.

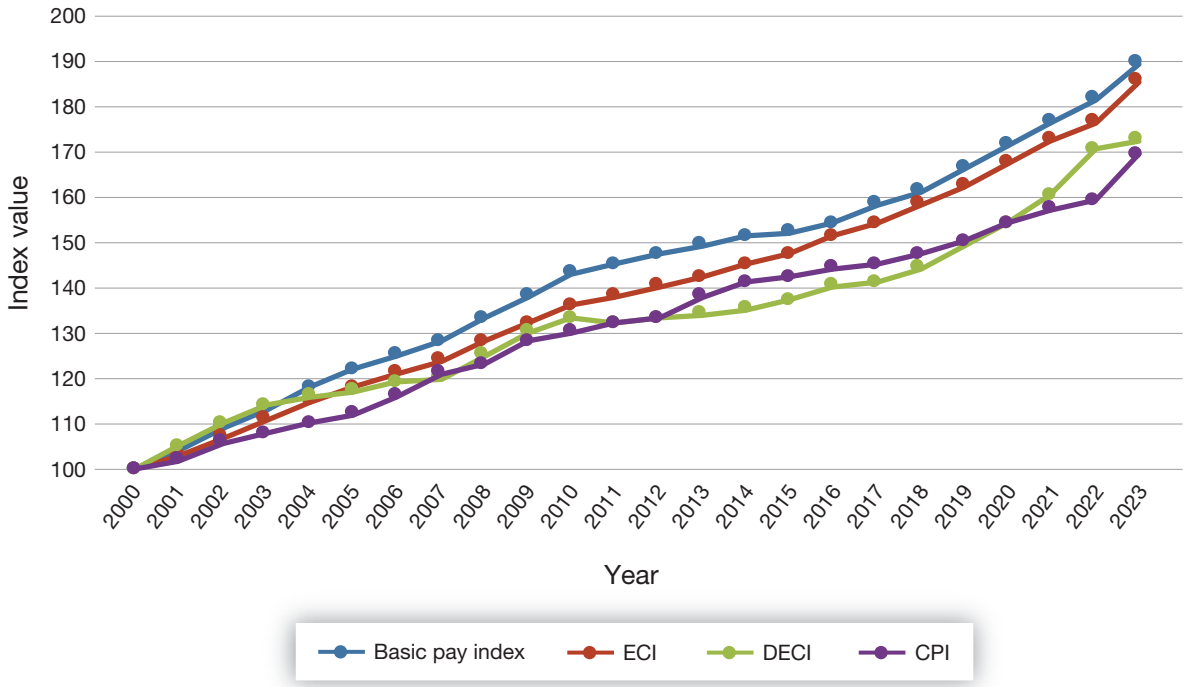
In general, then, increasing real wages means that nominal wage gains outpace prices. Since the CPI measures growth in prices (the denominator of the real wage ratio) and real wage growth is positive in most years, using a price index to guide the annual basic pay adjustment would tend to lead the growth rate of basic pay to fall behind the growth rate of civilian earnings (the nominal wage portion of the real wage ratio). This suggests that, conceptually, the CPI would fail the basic criteria outlined by the 7th QRMC—that is, it would not accurately measure the trend in pay accruing to the alternative civilian career choices facing active duty service members.

The CPI Was Below the DECI and the ECI for 18 of the Last 23 Years

This conceptual point is also reflected in the data. Figure 6.10 compares the CPI with both the DECI and the ECI. Using 2000 as the baseline year (equal to 100), the value of the CPI was lower than either the DECI or the ECI for 18 of the last 23 years, and by 2023 it was 16 index points lower than the ECI and three index points lower than the DECI. This pattern is consistent with the point made above: if real wage growth is positive in most years, the price index should, by definition, be lower than a nominal wage index (a category that includes both the DECI and the ECI).

Thus, both theory and empirical evidence indicate that the CPI does not and, in fact, cannot appropriately reflect changes in civilian earnings, making it a poor candidate for guiding the annual basic pay adjustment in terms of accuracy.

FIGURE 6.10
Changes in the CPI, ECI, BPI, and DECI Since 2000



SOURCE: CPI for all urban consumers, percent change from a year ago at the end of third quarter of the relevant year. Seasonally adjusted from FRED (Federal Reserve Bank of St. Louis Economic Data).

Timeliness

The CPI is released monthly, typically around ten to 15 days after the end of the relevant month. Thus, the CPI is a very timely index (though subject to the same issues related to the policy lag discussed above).

Cost-Effectiveness and Credibility

Like the ECI, the CPI is produced and disseminated at no cost to DoD. Thus, it is highly cost-effective. The CPI, due to its long history and its use in key roles throughout the economy, is also a highly credible measure.

Incorporating a More Recent Version of the Employment Cost Index

We also consider an alternative that would reduce the time lag between when the ECI is computed and the military basic pay raise by using an ECI that is computed closer to the pay raise. A reasonable candidate might be the ECI measure at the end of the second quarter (Q2) in the year prior to the annual pay raise, which is released in late July and would cover the months April–June, three quarters after the end of three-month period used to inform the current ECI guidance.[20] For example, in the context of Figure 6.2,

[20] We also considered the feasibility of using the CBO ECI forecast for this purpose, but given the findings on the substantial gap between the predicted values from this measure and the future, realized ECI value, and the fact that the prior actual ECI substantially outperformed these forecasts, we decided this was not a fruitful proposal for policymakers to consider. In Figure F.6 we provide results analogous to the those presented in Figure 6.11, using CBO ECI forecasts instead.

the January 2023 basic pay raise was informed by the October 2021 ECI under the current methodology, a 15-month lag. An alternative would use the Q2 2022 ECI, reducing the lag to six months. Thus, such an approach would reduce the policy lag by more than half. To facilitate the budget process shown in Figure 6.2, it would be necessary to use a placeholder ECI, either the current ECI guidance (computed in October) or a forecast of the ECI, such as the CBO forecast.[21] DoD would then need to adjust its budget once the Q2 ECI is released. If the placeholder understated the Q2 ECI, DoD would face a budget shortfall that it would need to close, and if it overstated the Q2 ECI, it would face a budget overage.

We note that this alternative does not involve an alternative index but is simply an alternative process for using the current index, the ECI, that involves updating the guidance it provides during the budget process. Thus, the characteristics of this alternative do not differ from the subsection above on the ECI in terms of accuracy, computation cost, or credibility. Because it would reduce the time lag, it would compare favorably in terms of timeliness.

A potential pitfall of this alternative process is that it introduces a forecasting error—the difference between the ECI used for the budget process and the more recent ECI—that has new implications for the budgeting process. As mentioned, the error could imply either be a budget shortfall or overage that DoD would need to address. Dealing with personnel budget shortfalls or overages would not be a new concept. DoD already uses a forecast of BAH rates in the budget process, and the actual BAH rates are released the December before the rates are implemented. On the other hand, in 2022 the budget cost of BAH for the active force across DoD was much smaller than the cost of basic pay, $22.9 billion compared with $63.9 billion, so that an error of the same magnitude would translate into a far smaller shortfall or overage than would be the case with basic pay (DoD, Office of the Under Secretary of Defense [Comptroller], 2023). For example, the cost of the annual pay adjustment for 2017 was around $750 million when a 2.1-percent basic pay increase was provided.[22] A small error between the ECI used for initial budgeting and the Q2 ECI in the year prior to the pay raise could have substantial fiscal implications.

We investigated the potential magnitude associated with the error and the budgetary impact by computing the size of the budget error if this approach had been used between 2013 and 2023. That is, we assumed the usual (October two years prior to the pay raise) ECI had been used for the purpose of budgeting while the Q2 ECI was the updated ECI that was used for setting the final pay raise. We then used data on basic pay costs for the active force across DoD in each year to estimate the budgetary shortfall or overage of any error between the usual ECI and the updated ECI in nominal dollars for each year we consider.

Figure 6.11 shows our estimate of the budgetary implications of the error in each of the 11 years. A negative value indicates that the updated Q2 ECI would have been larger in magnitude than the usual ECI (the ECI currently used for guidance). In such a case, the DoD comptroller would be required to reprogram funds from other uses to make up the shortfall in the basic pay adjustment left by the earlier guidance being too low. Conversely, positive values indicate that the earlier guidance indicated employer cost increases that were larger than the updated guidance. In these years the comptroller would have funds that could be reallocated elsewhere in the budget.

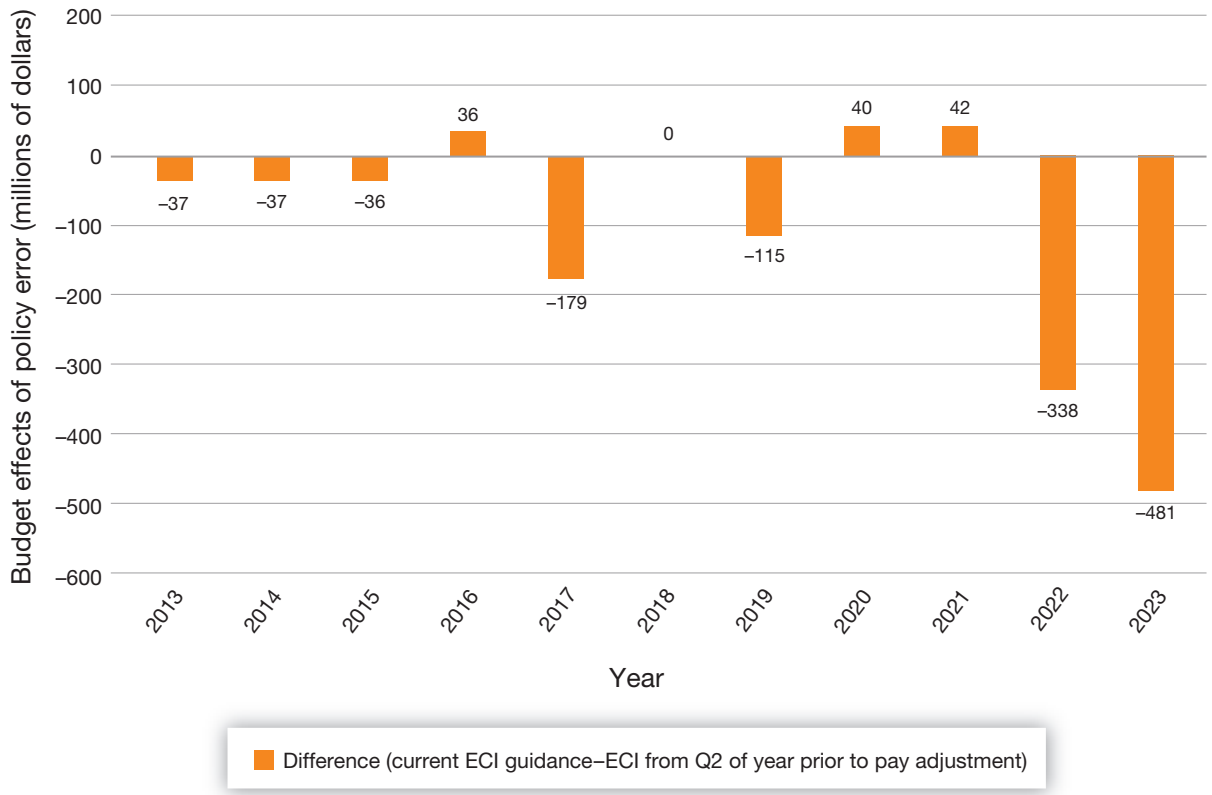
We find that the fiscal implications are mixed between 2013 and 2023. In one year, 2018, the update did not change anything, so it would have had no implication for the budget process. In 2013 through 2015, the update would have provided guidance on a slightly higher pay increase, and the budget implications would have meant a shortfall of $36 million to $37 million. In three other years, 2015, 2020, and 2021, overages of a

[21] This proposal was suggested to the project team by the Navy during an interim project review.

[22] This figure comes from author calculations using Greenbook data.

FIGURE 6.11

Fiscal Implications of Using Current ECI Guidance at the Start of the Budget Process and Then Revising with a Later ECI Measure



SOURCE: Author calculations using data on force size and basic pay by grade and year of service from the Greenbook (2013–2023) and ECI data from the BLS.

similar magnitude (between $37 million and $42 million) would have occurred. In 2017 and 2019, the budgetary shortfalls were considerably larger, between $115 million and $179 million.[23]

But the shortfalls of 2017 and 2019 would have been dwarfed by the shortfalls that would have occurred in 2022 and 2023, the years of rapid price and employer cost inflation in the aftermath of the COVID-19 pandemic. In these two years, the use of this approach would have required adjustment late in the budget process in amounts of, respectively, $338 and $481 million. Additionally, we note that these estimates are only an approximation of the direct fiscal cost of providing basic pay increases. We only considered direct basic pay costs and not the cost of other elements of military compensation that depend on basic pay such as the retirement accrual cost and the Federal Insurance Contribution Act contributions that DoD makes on behalf of service members. These other elements would amount to roughly half the basic pay bill, implying that a further adjustment of $170 and $240 million would have been required in 2022 and 2023, respectively.

This analysis suggests that the potential for this process to be feasible depends critically on the appetite among policymakers to accommodate potentially large adjustments in times of economic volatility. In most recent years the amount of budget uncertainty implied by this kind of approach was reasonable in terms of

[23] Rather than use the current ECI Guidance at the start of the budget process, an alternative approach could be to use the CBO ECI forecast. Figure F.6 in Appendix F shows the fiscal implications of using the CBO ECI forecast instead.

the size of the overall defense budget, but in at least four years from the last decade, the adjustments implied by this alternative approach would have led to substantial shortfalls from what was implied by the preliminary ECI guidance.

Discussion

The findings of our analysis of the ECI are consistent with past research (Asch et al., 2020) that has highlighted potentially important limitations of the ECI as a means of guiding the annual basic pay increase. These include the findings that the ECI

- is not designed to accurately reflect civilian earnings for workers but is, instead, designed to reflect employer labor costs; this limitation means that the ECI does not capture the upward effect on civilian earnings of workers switching jobs during periods of robust economic growth, nor does it reflect the downward or moderating effect on civilian wages of layoffs and other employment changes associated with economic downturns
- holds the mixture of jobs used in the sample constant for several years at a time, which may not fully reflect earnings changes related to growth or contraction in the share of various occupations in the economy
- is representative of the overall civilian labor force, which differs in important ways from the active duty military force, including in age, education level, and gender.

The ECI has some important advantages. First, it is used in setting pay for federal employees, so using this source of guidance helps to ensure some confluence between rates of growth of basic pay and pay in federal government careers, one of the largest sources of veteran employment. Second, it captures broad changes in the civilian labor market in general. To the extent that service members make retention decisions based on the civilian labor market in general—perhaps taking a career perspective that considers current and future earnings at older ages and all civilians rather than the earnings of civilians who currently have characteristics similar to those of service members—the ECI would capture these civilian earnings better than the DECI. Third, the ECI is a timely, well-regarded measure that is produced at no cost to DoD. Finally, one of the shortcomings of the ECI pointed out above—that it does not capture important economic forces that can lead to both more rapid increases in civilian earnings or moderation or even declines in earnings—could also potentially be viewed as a positive factor, as the ECI tends to have relatively small fluctuations over time compared with the CPI or the DECI.

Our analysis of the CBO's ECI forecast led us to conclude that it is not appropriate for use in guiding the annual basic pay adjustment. Over the past 12 years, we found that the forecasted value of the ECI at the time of the pay raise created by the CBO was typically less accurate in terms of reflecting the actual value of the ECI at the time of the pay raise than the actual ECI 15 months before this time. Additionally, the CBO's forecast data are released on an irregular schedule, suggesting that the timeliness of this measure would not be dependable.

We find that the DECI has multiple features that directly address the shortcomings raised regarding the ECI. These advantages include

- using a data source, the CPS, that surveys workers and that can better capture earnings changes related to job switches and other factors affecting earnings opportunities of workers, such as changes in the mix of occupations
- weighting the current population survey using the age, education, and (if required) gender mix of active duty military personnel who are, on average, younger, have less educational attainment, and are more heavily male than the overall civilian labor force; additionally, these weights are updated annually so

that changes in the mix of military personnel are fully reflected in the guidance for the annual basic pay adjustment.

Characteristics of the DECI that may make it less advantageous for guiding the annual basic pay adjustment include its greater responsiveness, which leads to more volatility in the magnitude of changes that would guide the annual basic pay adjustment. In recent years this volatility would have potentially led to basic pay adjustments that would have more rapidly reflected the wage inflation in the wake of the COVID-19 pandemic. But in other cases, this volatility might be less ideal from a policymaking perspective, even if it were to reflect civilian earnings changes more accurately. However, just as Congress ultimately set pay at levels that deviated from the ECI since 2000, it could also address this issue with the DECI in a discretionary fashion to tamp down the DECI's greater swings. Alternatively, it could do so more formally by, for example, using a moving average of the DECI.

Additionally, it is possible that there could be issues around the credibility of the DECI depending on the organization used to calculate it and the transparency of the process. However, given that there are now two decades of research on the DECI, including published code used in its calculation in Asch et al. (2020), we believe these concerns are relatively minor.

It is also the case that the DECI could be a useful additional tool for policymakers in setting the annual basic pay adjustment even if the ECI continued to be the formal measure for guidance. Policymakers have on numerous occasions in recent years departed from the ECI guidance and enacted basic pay adjustments reflecting other considerations. The DECI can help to inform these departures from the ECI guidance by, first, considering how it differs from the ECI and, second, creating DECI measures for subgroups of interest in the military population—for example, officers—that could help to develop a more well-rounded picture of the appropriate basic pay adjustment.

Our analysis of the CPI suggested that on both theoretical and empirical grounds it is not a strong candidate for use as the official guidance in setting the annual basic pay adjustment. Among other applications, the CPI and, in other cases, similar measures of price changes, are used to develop estimates of real earnings growth, which is the ratio of nominal wages to price changes. Real earnings growth is positive in most years, meaning that nominal wage growth exceeds the rate of price increases (price inflation). Thus, using the change in prices measured by the CPI would, in most years, lead to much lower increases in pay than any representative measure of nominal earnings. This is borne out in the data, where we show that over a 24-year period we present evidence on, the CPI was always lower than the ECI and was lower than the DECI in all but five years of this time series.

Finally, using a more updated ECI could improve the timeliness of the ECI but would require relying on the current ECI guidance (or a forecast of the ECI) during the budget process. This alternative process could result in budgetary errors that would need to be addressed by DoD. Over the last decade, we found years where the budgetary error involved a shortfall of around $36–$37 million and other years where the shortfall was far larger, exceeding $300 million. Such shortfalls suggest that the desirability of this approach depends critically on the willingness of policymakers to face potentially consequential budget revisions relatively late in the budgeting process.

An Alternative Approach to Improving Timeliness

The timeliness of any candidate measure for guiding the annual basic pay adjustment must still contend with the extended period of time between when the data on earnings are collected and disseminated and when the annual basic pay adjustment is implemented. This 15-month lag is especially relevant in times of rapid changes in civilian labor market conditions such as those that have occurred in the aftermath of the COVID-19 pandemic. However, 20 percent of this 15-month total delay is the three-month period between

the beginning of the fiscal year in October and the implementation of the pay adjustment in January. This period appears to be discretionary in nature, since pay adjustments took effect at the beginning of the fiscal year from 1972 through 1982 (Defense Finance and Accounting Service, undated). Thus, one approach to shortening the delay is to adjust pay in October, at the beginning of the fiscal year, rather than in January. Implementing this approach would involve a onetime cost in the year when the transition from January to October occurred. Another potential disadvantage is the greater use of continuing resolutions in recent years, which would require that the pay raises implemented in October would need to come from a continuing resolution. On the other hand, the ECI guidance would be more timely and relevant to the actual pay raise.

Chapter Summary

Section 643 of H.R. 7900 of the FY 2023 NDAA directed DoD to enter into an agreement with a federally funded research and development center to determine whether DoD should continue to use the ECI to adjust basic pay or should instead consider alternative measures, including the DECI, given the tumultuous years since the COVID-19 pandemic that put a spotlight on the accuracy and timeliness of the ECI. This requirement was incorporated into the work of the 14th QRMC.

Our analysis leads to the conclusions that the CPI and the CBO's ECI forecast are not viable alternatives. The CPI does not and cannot accurately reflect earnings growth in the civilian labor market and the civilian opportunities faced by service members while the ECI forecast proved less accurate historically than the ECI currently used. While the DECI has some clear advantages over the ECI, the ECI is not without its benefits, not the least of which is that it is credible, relatively stable, and adequate in terms of accuracy. That said, even if the DoD continues to use the ECI, the DECI could provide useful additional information on whether it made sense to deviate from ECI guidance. Regardless of whether the DECI and/or the ECI is used, the analysis indicates that timeliness would be improved if DoD reverted to pay increases that began in October (at the beginning of the fiscal year), rather than January (at the beginning of the calendar year).

CHAPTER 7

Adjusting Basic Pay for Critical Skills

Legislative language in the NDAA for 2023 motivated the policy questions we addressed in our analysis. Section 643 of H.R. 7900 requires a study of basic pay that includes

> (2) An assessment of whether to modify current basic pay tables to consider higher rates of pay for specialties the Secretary determines are in critical need of personnel, or whether employing the system of supplementing basic pay with bonuses and other special and incentive pays adequately addresses the need for "wage differentials" among such specialties. The assessment shall specifically consider the degree to which the need for higher rates of pay for critical occupational specialties occurs broadly across the Force.

Three policy questions spring from the legislative language:

1. Does the need for higher pay in critical skills occur broadly across the force?
2. Does the current system of supplementing basic pay with bonuses and special pays adequately address the need for wage differentials for these specialties?
3. Should the pay table be modified to provide wage differentials for critical specialties?

To help answer these policy questions, we took a data-driven approach informed by SME discussions and a literature review to consider three related research questions:

1. What is the prevalence of critical specialties, and how much is cash compensation higher owing to receipt of S&I pays?
2. Does the evidence indicate that the current S&I pay system is adequate for providing wage differentials?
3. What might a pay table approach to offering wage differentials for critical skills look like, and what are the advantages and disadvantages of a pay table approach?

Our approach began with discussions with DoD and service SMEs conducted in the winter and spring of 2023. We also conducted a literature review of the effectiveness of S&I pays. We used DMDC military pay files from 2015 to 2021 to tabulate the prevalence of personnel in critical specialties and the extent to which their military pay is higher owing to receipt of S&I pay.

We begin this chapter with an analysis of the prevalence of critical specialties. We then consider evidence on whether the current S&I pay system is adequate for providing wage differentials, and the extent to which pay is higher in critical specialties owing to S&I pays. This is followed by a summary of the SME observations on pay for service members with critical skills, and a brief literature review. Finally, we consider a pay table approach for creating wage differentials, and then draw some conclusions.

We would like to note that DMDC military pay file data over this time period are imperfect, as there is evidence that these data do not capture all S&I pays received by service members. As a result, our analyses probably understate the extent of the use of S&I pays. The CBO recently used the same data and found broadly similar results (CBO, 2023b). Furthermore, other studies have found similar results using data from earlier periods (see, e.g., Asch, Hosek, and Martin, 2002). Thus, we think the broad implications are sound, but specific estimates could be problematic.

Identifying Critical Skill Areas

Based on service and OSD SME discussions, as well as DMDC data, we identified 11 critical skill areas or specialties, shown in the box. We used DMDC compensation data for 2021 to find the prevalence of receipt of special pays or bonuses for example occupations in each of these areas, as shown in Table 7.1. We found that those occupations identified by SMEs as being critical tended to show a high prevalence of receipt of special pays or bonuses. This does not indicate, however, that every occupation listed necessarily requires a wage differential. For example, the infantryman occupation is essential to the operation of the Army, and sometimes may require high Selective Reenlistment Bonus (SRB) amounts to sustain retention for certain critical skill indicators; high SRBs may also be needed for Skill Level 1 service members assigned to specific locations (such as the 75th Ranger Regiment), but other cases typically require only a low-tier SRB or no SRB at all. This is reflected in Table 7.1, which shows that only 27 percent of Army infantrymen received special pay or a bonus, as opposed to 98 percent for Army Special Operations Forces.

Critical Skill Areas Identified by SMEs

The following critical skill areas were identified:

- aviation
- cybersecurity operations
- explosive ordnance disposal
- foreign language proficiency
- infantryman
- intelligence
- medical
- nuclear professions
- recruiting
- skilled repair
- Special Operations Forces.

SOURCE: Authors' interviews of SMEs, and DMDC pay data for enlisted members, 2015–2021.

TABLE 7.1
Prevalence of Special and Incentive Pays in Critical Occupations, Enlisted Members, 2021

Occupation	Army	Navy	Department of the Air Force	Marines
Aviation	46% (15T)	95% (AWF)	95% (1A2)	52% (627)
Cybersecurity operations	41% (17C)	9% (CTN)	96% (1B4)	28% (171)
Explosive ordnance disposal	80% (89D)	99% (EOD)	81% (3E8)	31% (230)
Foreign language interpreter	22% (35P)	14% (CTI)	71% (1A8)	9% (264)
Infantryman	27% (11B)	—	23% (3P0)	12% (031)
Intelligence	34% (35Z)	28% (IS)	97% (1N7)	12% (021)
Medical	22% (68W)	18% (HM)	15% (4N0)	—
Nuclear	23% (74D)	77% (ETN)	76% (2W2)	6% (571)
Recruiting	95% (79R)	62% (NC)	84% (8R0)	0% (841)
Skilled repair	46% (15T)	54% (MR)	66% (2M0)	6% (217)
Special Operations Forces	98% (18F)	95% (SO)	10% (2A2)	74% (037)

SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

NOTE: The number and letter sequences in parentheses indicate the occupation designation for which the prevalence statistic has been calculated.

The Incidence of Special Pays and Bonuses

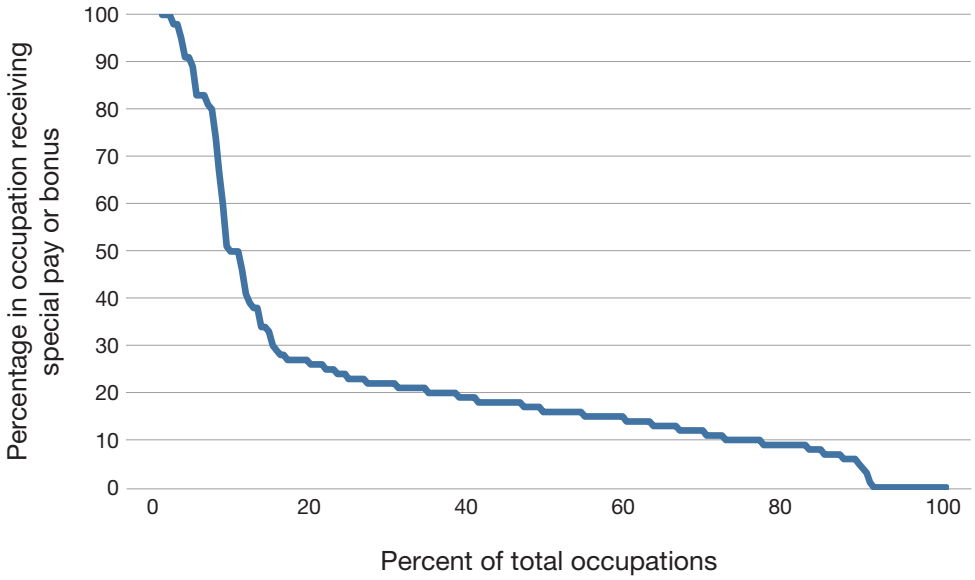
As an initial assessment, we tabulated the incidence of special pays and bonuses within each occupation. Using DMDC pay data for September 2021, we determined the portion of individuals within each occupation who received a special pay or bonus. Figure 7.1 shows the incidence of S&I pays among Army enlisted personnel, where we find that only a small share of occupations show a high incidence of S&I pays: the top 20 percent of occupations have 25 percent or more of members receiving special pays or bonuses, the top 10 percent have 50 percent or more, and the top 5 percent have 83 percent or more. Incidence of S&I pay receipt is highly skewed (i.e., more concentrated in a small share of occupations) among Army enlisted members. This is evidence that S&I pays are targeted to a select group of occupations. We show analogous results for the Department of the Air Force, Marine Corps, and Navy in Appendix G.

Figure 7.2 shows results for Army enlisted members when we consider the incidence of S&I pay by percentage of total strength (Army end strength). Figure 7.2 is similar to 7.1, but each occupation is weighed by strength. In Figure 7.2 the incidence of S&I pays is even more highly skewed: in the top 10 percent of total strength, 27 percent or more of members receive special pay or bonuses, and in the top 5 percent of total strength, 50 percent or more of members receive special pay or bonuses. This is additional evidence that S&I pays are targeted to a select group.

We see a similar concentration of the incidence of special pay and bonuses among commissioned officers. Figure 7.3 shows the incidence of receipt of special pay or bonuses among officers in the Army. The results are similar to those seen with the enlisted members.

FIGURE 7.1

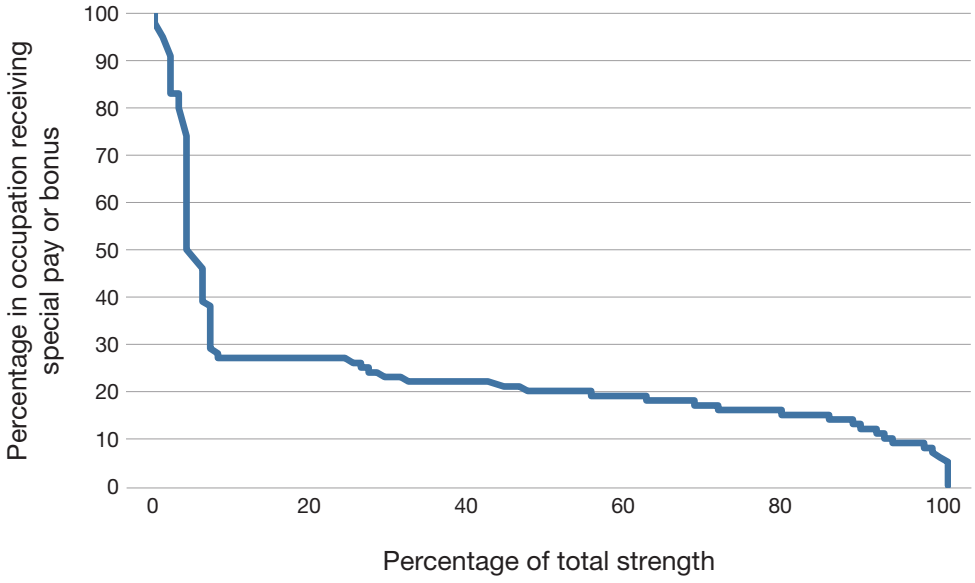
Percentage of Personnel Receiving Special and Incentive Pays by Percentage of Total Occupations: Army Enlisted Members



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

FIGURE 7.2

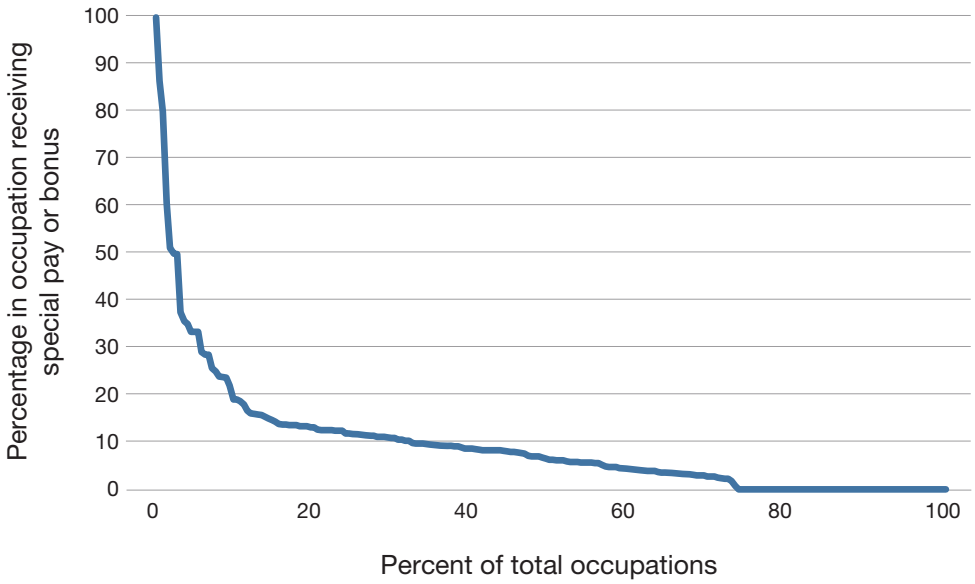
Percentage of Personnel Receiving Special and Incentive Pays by Strength: Army Enlisted Members



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

NOTE: The figure shows the percentage of individuals in each occupation receiving S&I pays, where each occupation is weighted by the number of Army enlisted members in that occupation.

FIGURE 7.3
Percentage of Personnel Receiving Special and Incentive Pays by Percentage of Total Occupations: Army Officers



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

Special Pay and Bonuses as a Fraction of Overall Cash Pay

Beyond the incidence of special pay and bonuses by occupation, the size of the special pay and bonuses is also important. We measure the size relative to total compensation. That is, for each individual within an occupation we calculate the share of total compensation due to special pay and bonuses, and then we average across all individuals within an occupation to calculate the unconditional mean share of total compensation accounted for by special pays or bonuses. To create the figures, we sort the occupations by shares from high to low, and then plot by occupation.

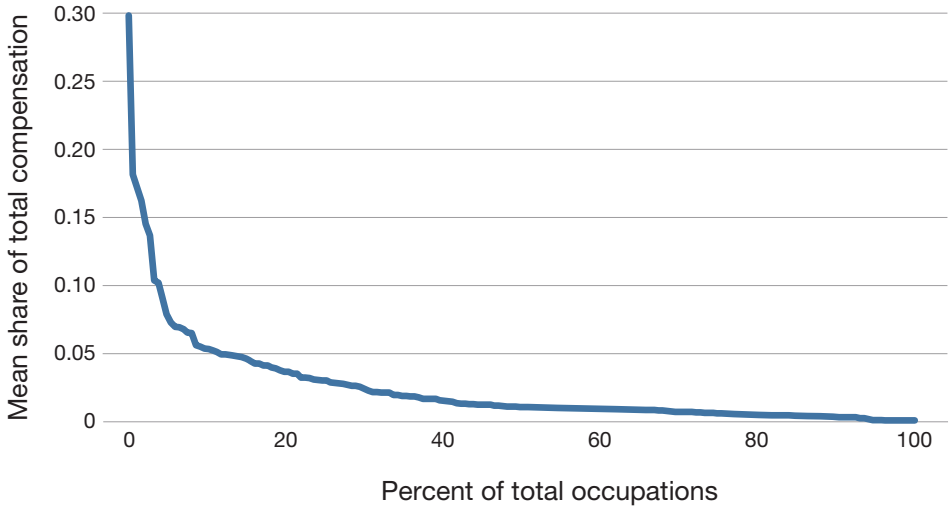
Figure 7.4 shows the unconditional mean share of total compensation accounted for by S&I pays for enlisted members in the Army. The graph is highly skewed to the left, showing that special pays or bonuses are concentrated in a relatively few critical occupations. Less than 4 percent of Army enlisted occupations are associated with special pays or bonuses that account for 10 percent or more of total compensation.

Similarly, Figure 7.5 shows a graph of the unconditional mean share of total compensation for Army officers. Like the graph for Army enlisted members, this graph is skewed to the left, showing that special pays or bonuses are concentrated in a relatively few critical occupations. Less than 5 percent of Army officer occupations have special pays or bonuses that account for 10 percent or more of total compensation.

When totaling S&I pays received, we included all special pays and bonuses—even those not associated with a particular occupation. Thus, to some extent these figures overstate the share of compensation associated with an occupation. For example, if a service member received imminent danger pay because of a deployment, then that amount was included in the total, even though receipt of imminent danger pay might not be due to their occupation. Similarly, an individual might receive sea pay, although receipt of sea pay is due to their duty rather than their occupation. Many incentive pays are for duties that are not occupation or skill related, or related to critical skills, though they may be correlated to certain skills. We were intentionally conservative in constructing our measure, treating all pays equally; the alternatively would have been to construct a measure that would have had to rely on judgments about which pays are occupation and skill related and which are not.

FIGURE 7.4

Average Special and Incentive Pay Share of Total Compensation, by Percentage of Total Occupations: Army Enlisted Members

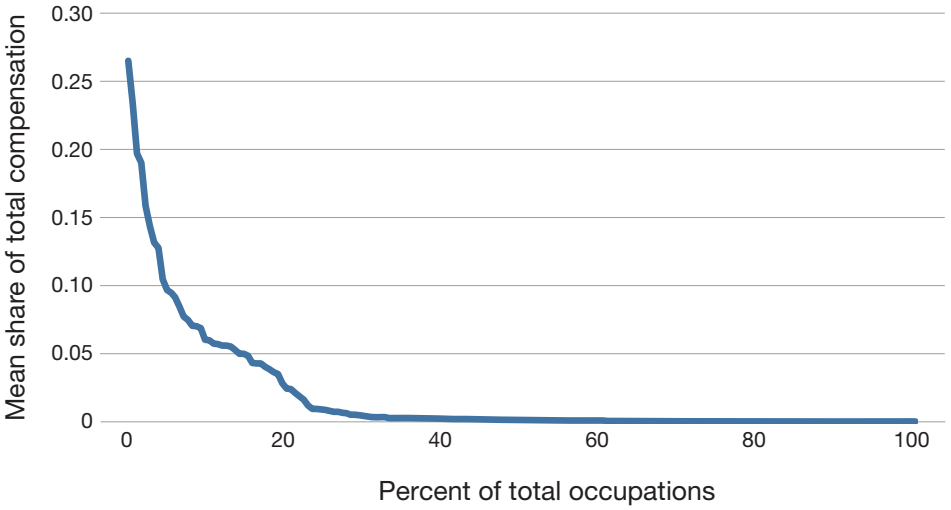


SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

NOTE: This figure shows the average share of total compensation received by individual service members that is accounted for by S&I pays. The share of total compensation accounted for by S&I pays is computed for each service member within an occupation, and then averaged across all members within each occupation. The average shares by occupation are then sorted from high to low and plotted to produce the figure.

FIGURE 7.5

Average Special and Incentive Pay Share of Total Compensation, by Percentage of Total Occupations: Army Officers



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

NOTE: This figure shows the average share of total compensation received by individual service members that is accounted for by S&I pays. The share of total compensation accounted for by S&I pays is computed for each service member within an occupation, and then averaged across all members within each occupation. The average shares by occupation are then sorted from high to low, and plotted to produce the figure.

The Extent to Which Pay Is Higher in Critical Specialties

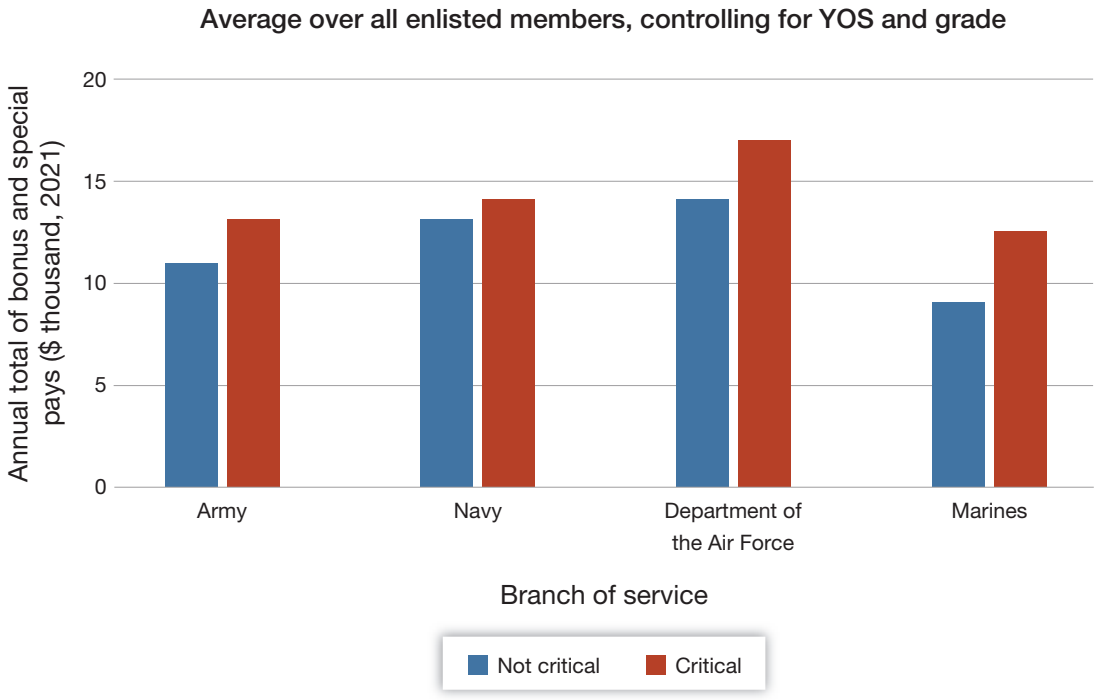
We found that cash compensation is higher in critical occupations across all services. We did this by estimating regression models that show the relationship between cash compensation and being in a critical occupation, while controlling for grade and YOS. The regression models were estimated on DMDC pay data by individual from 2016 to 2021. The dependent variable was total compensation, and the independent variables were YOS, grade, and indicator variables for receipt of special pay, receipt of bonuses, and whether the service member was in a critical occupation, as well as the critical occupation indicator interacting with the indicators for receipt of bonus and receipt of special pay. (The critical occupation indicator was based on the occupational areas identified in the box above.) Our regression results show that, conditional on getting bonuses and special pays,

- total compensation is higher in critical occupations than in noncritical occupations across all services
- special pays are higher in critical occupations than in noncritical occupations in all services except the Navy
- bonuses are higher in critical occupations than in noncritical occupations across all services.

We summarize these results from the regressions in Figures 7.6–7.9. The regression estimates themselves are presented in Appendix G.

We find that the sum of bonus and special pays is greater for those in critical specialties in all services and for both officers and enlisted members. In Figure 7.6 we can see that enlisted members in critical occupations earn from about $1,000 to $4,000 more annually, while in Figure 7.7 we can see that officer members in

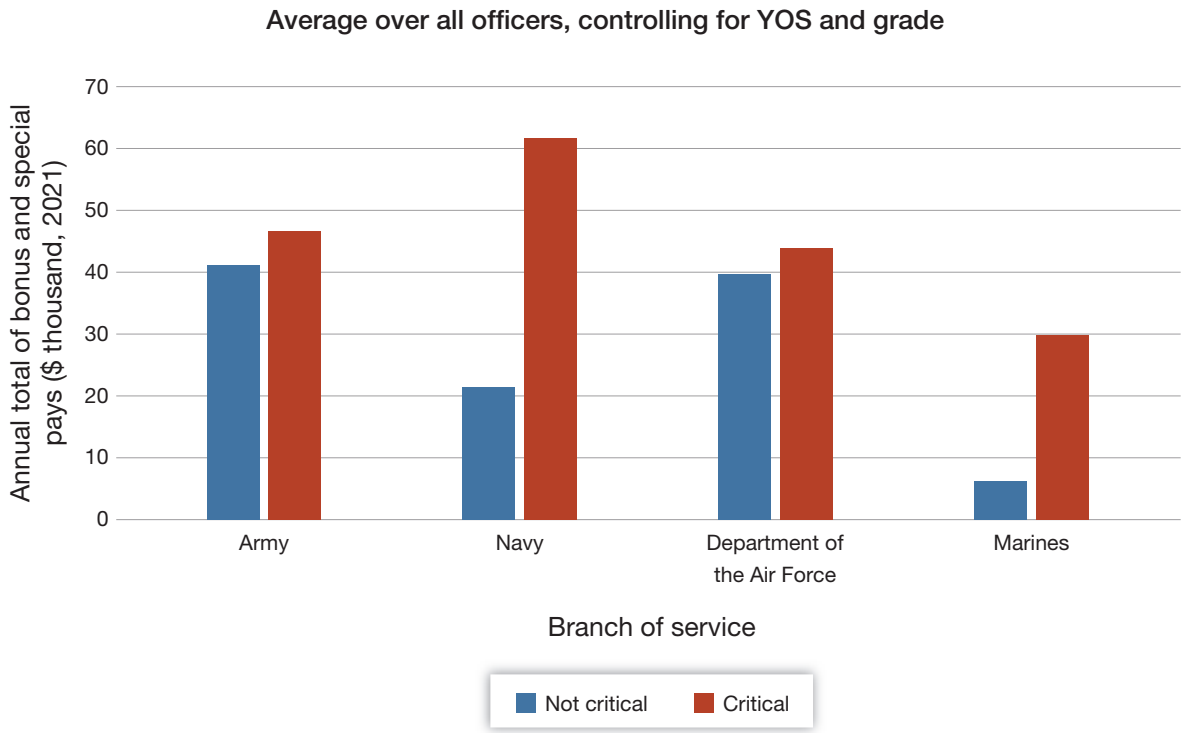
FIGURE 7.6
Average Enlisted Annual Total of Bonus and Special and Incentive Pays for Each Member, by Critical and Noncritical Occupations



SOURCE: Calculations based on DMDC pay data for individual members from 2016 to 2021.
NOTE: Averages are conditional on receipt of bonus and special and incentive pays, controlling for YOS and grade.

FIGURE 7.7

Average Officer Annual Total of Bonus and Special and Incentive Pays for Each Member, by Critical and Noncritical Occupations



SOURCE: Calculations based on DMDC pay data for individual members from 2016 to 2021.
NOTE: Averages are conditional on receipt of bonus and special and incentive pays, controlling for YOS and grade.

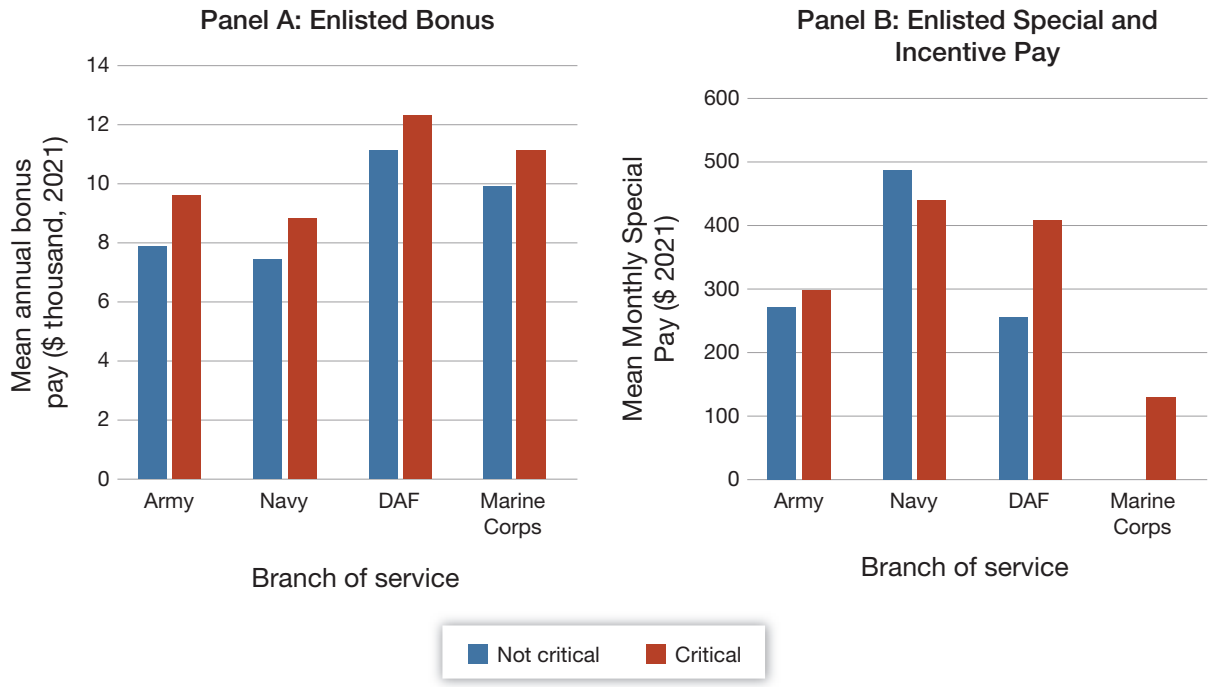
critical occupations earn from about $4,000 to $40,000 more annually than their peers in noncritical occupations. (We note that data from any skill areas that received bonuses based on criticality and were not included in the box above could serve to blur the relationship shown in Figures 7.6 and 7.7.)

When examining Figures 7.6 and 7.7, it is important to bear in mind that the sum of the bonuses and S&I pays includes both pays that are contingent on commitment to an additional service obligation and pays that are unconditional in that they are paid by virtue of the nature of the assignment or occupation and are not contingent on a service commitment. Thus, the wage differential between critical and noncritical occupations consists of both conditional and unconditional pays, some portion being paid as a matter of course and another portion being paid in exchange for the service member giving up the option to freely leave the service for some period of time. The wage differential consists of both types of pay: unconditional (typically denoted as special pays), and conditional (typically bonuses). However, while we can calculate the difference in the receipt of the total of both types of S&I pays between critical and noncritical occupations, this does not necessarily mean it would be desirable to implement a wage differential as a single unconditional pay based on this calculated difference. We discuss this further in the section on the pay table approach to creating wage differentials.

We also found that bonus pay was uniformly higher for officers and enlisted members in critical occupations. In addition, special pay was also higher for service members in critical occupations, with the exception of the Navy (likely due to the receipt of sea pay). Figures 7.8 and 7.9 show bonus and special pay (controlling for grade and YOS) for enlisted members and officers, respectively.

FIGURE 7.8

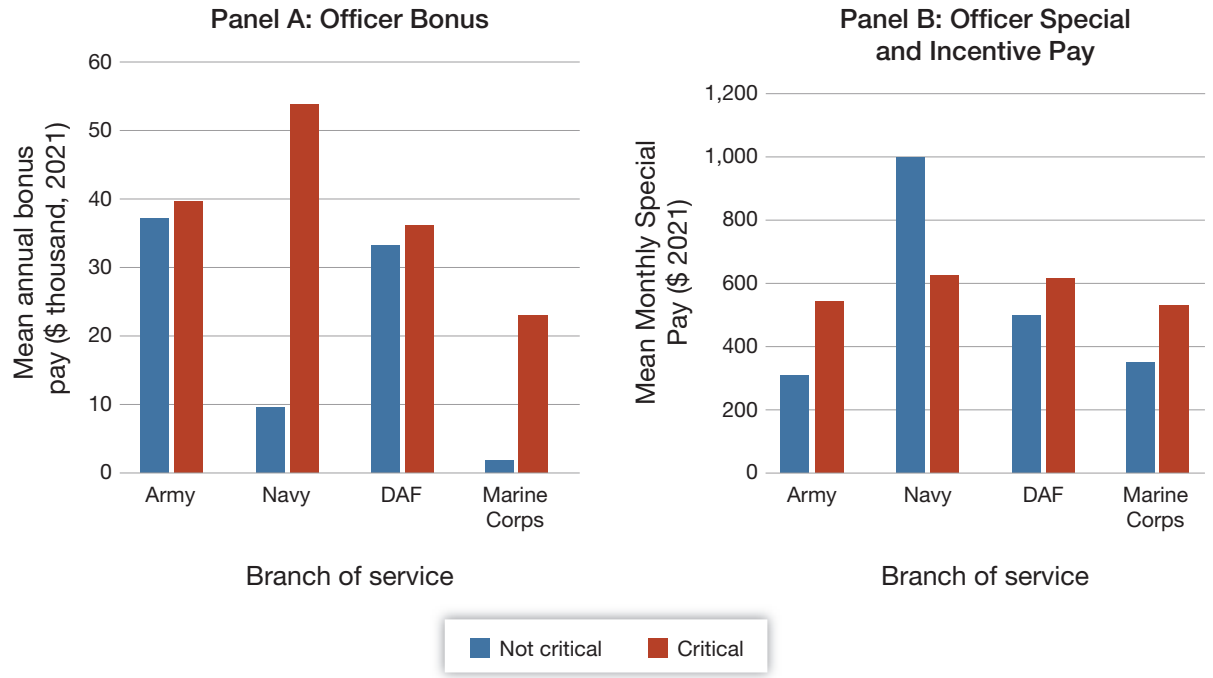
Mean Enlisted Bonus Pay and Special and Incentive Pay, by Critical and Noncritical Occupations



SOURCE: Calculations based on DMDC pay data for individual members from 2016 to 2021.
NOTE: Averages are conditional on receipt of bonus and special and incentive pays, controlling for YOS and grade.

FIGURE 7.9

Mean Officer Bonus Pay and Special and Incentive Pay, by Critical and Noncritical Occupations



SOURCE: Calculations based on DMDC pay data for individual members from 2016 to 2021.
NOTE: Averages are conditional on receipt of bonus and special and incentive pays, controlling for YOS and grade.

Insights from Other Sources

Previous Research

Previous research has demonstrated the utility of bonuses and special pays in providing wage differentials for critical occupations (Hosek, Mattock, and Asch, 2019). We know that bonuses are positively related with accession and retention (Asch et al., 2010; Goldberg, 2002; Knapp et al., 2018), and that pays associated with multiyear contracts (e.g., Aviation Bonuses [AvBs], Retention Bonuses, and SRBs) are cost-effective (Asch et al., 2021; Mattock et al., 2019). S&I pays can provide wage differentials and are more efficient when compensation is conditional on a multiyear retention commitment (Hosek, Mattock, and Asch, 2019); we discuss this point more when we discuss pay table options in the following section. We also know that, all else being equal, inflation reduces the real value of special pays, thereby reducing their retention effect over time (Calkins et al., 2023).

On the other hand, there is to our knowledge no research on whether bonuses and special pays are inefficiently set too high or are too broadly applied, thereby resulting in the services paying more economic rents. While it may be relatively straightforward to detect if bonuses and special pays are set too low, as this will lead to not meeting retention goals, it is much more difficult to detect if pays are overly generous. In addition, research on the relationship between special pays and outcomes other than retention (such as willingness to take certain assignments or perform certain duties) is sparse. One exception is combat compensation (Pleeter et al., 2011; Simon et al., 2011), and another is work on Assignment Incentive Pay and the Navy's auction system for it (Golding and Cox, 2003; Golfin, Lien, and Gregory, 2004).

SME Discussions

In general, the SMEs we consulted favored using S&I pays rather than basic pay to raise pay for service members in critical skill occupations. They expressed considerable support for the current S&I pay approach to differentiating pay by skill area, saying that this approach is transparent, predictable, and effective.

However, most SMEs saw potential areas for improvement. Some said that more pay differentiation for critical skills would be desirable, since the current system "pays a lot of rents" to noncritical skills. That is, they were of the opinion that the current system results in paying many service members in noncritical skill occupations more than is required to retain an adequate quantity and quality of personnel in these occupations and that many of the recipients would have stayed even if they were not receiving S&I pays.

Other experts said pays were not necessarily well coordinated when service members were eligible for multiple pays, and that pays can work in counterproductive ways (e.g., simultaneously offering an active retention bonus and a reserve affiliation bonus to the same people), thereby driving up cost.

Others said that the rationale for the current dollar amounts needed to be clearer. S&I pays are only adjusted infrequently, and those that are stated in nominal values are not automatically adjusted for inflation. Thus, the value of some S&I pays may decay over time. However, that is not to say that all special pays should necessarily be adjusted for inflation, as the required level of special pays may, in some cases, fluctuate. For example, the demand for commercial pilots fell considerably during the first decade of the century when the major airlines were consolidating, resulting in the Air Force reducing the timing and duration of multiyear contracts that were offered. (Some S&I pays adjust "automatically" over time. For example, some services implement SRBs by stating them in terms of multiples of monthly basic pay, which means that these SRBs are implicitly indexed to the basic pay table.)

SMEs also commented on the potential of using different basic pay tables to create wage differentials for critical skills. Several SMEs stated that the administrative burden of setting skill-specific pay tables could be prohibitive, difficult to plan within the budgeting process, and hard to coordinate across services with a common skill area (e.g., that of pilots). A few SMEs were supportive of giving serious consideration to

separate pay tables for certain specialties (e.g., doctors, dentists, pilots, and highly technical areas and elite skills for enlisted members). Separate pay tables could potentially eliminate the need to "artificially" promote people solely for compensation purposes.

Some SMEs suggested that one possibility for implementing skill-based pay would be to give service members in critical skills a *coefficient* multiplier that would be applied to the standard pay table. For example, service members in one critical skill occupation could have a coefficient of 1.1, meaning that their monthly basic pay would be 10 percent higher than the default basic pay for a given YOS and grade. We will explore a variant of this approach further below.

Pay Table Approach to Creating Wage Differentials

We consider two approaches that would add a wage differential to the baseline basic pay table: an *additive approach*, where a fixed amount is added based on grade and YOS, and a *multiplicative (or coefficient) approach*, where a simple linear function (a multiplier plus a constant) is applied to the baseline basic pay table.

The rationale for considering these two approaches is that they each provide a direct means of adjusting a baseline basic pay table to create a wage differential. A simple formula that can be applied to the existing pay table would be more straightforward to implement than, say, creating an entirely new pay table, such as a time-in-grade pay table, for certain select occupations. The advantage of the additive approach is that the amounts to be added can initially be directly derived from existing S&I pays, as we discuss below. To the extent that S&I pays for an occupation can be directly mapped onto grade and YOS, the additive approach could come close to replicating the existing wage differential. The multiplicative approach would not be able to come as close to replicating the exiting wage differential unless the coefficients were allowed to vary by each grade and YOS cell, which would be administratively burdensome. A potential advantage of the multiplicative approach is that the nonconstant part of the wage differential would adjust automatically as the baseline basic pay table is adjusted; this is also a potential disadvantage, as there is no guarantee that the factor used to adjust basic pay would necessarily be the correct adjustment for the nonconstant part of the wage differential. The factors used for the additive approach would need to be adjusted over time; as this differential is not linked to the pay table, this would need to be done through a process that could potentially be as administratively burdensome as the existing S&I pay structure.

The following discussion of the additive approach draws heavily on research originally presented in Hosek, Mattock, and Asch (2019). The additive approach could be implemented by creating a wage differential that would equal the sum of S&I pays that are stable over time, scheduled to a particular point in a career, not involving an incentive to select a longer obligation, and not conditional on the realization of certain military circumstances. Thus, the initial values of the wage differential would be created by summing the values of existing S&I pays; successive values of the wage differential would need to be determined by a process similar to that whereby the precursor component S&I pays were determined.

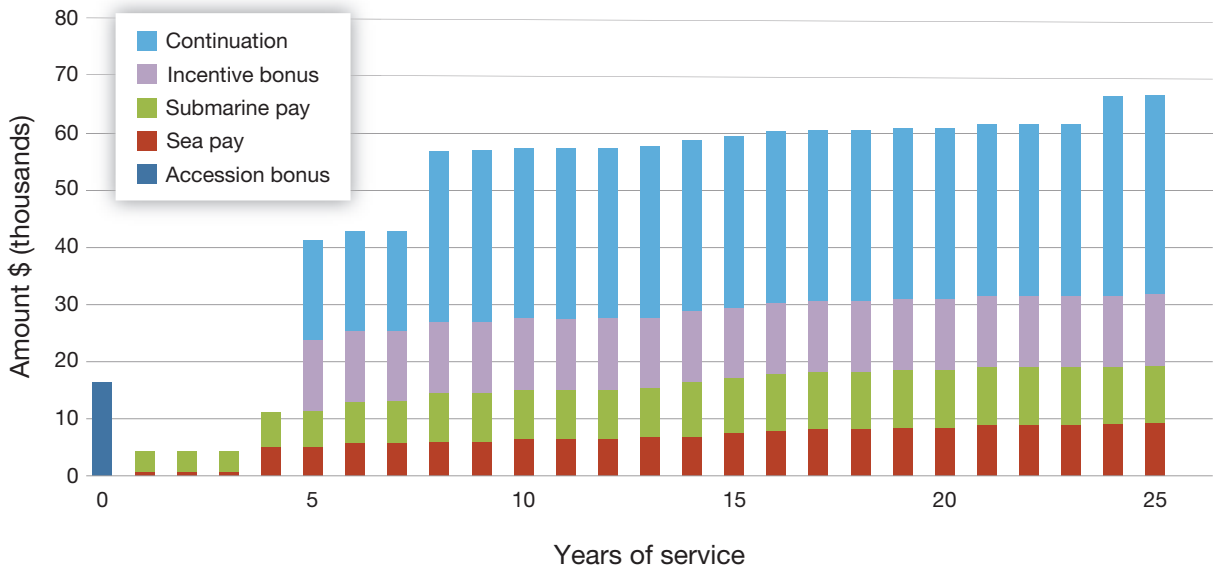
Under the multiplicative approach the wage differential would equal a constant plus some multiple of basic pay. The value of the coefficients could initially be calibrated based on approximating the sum of the existing unconditional S&I pays.

The Additive Approach

We illustrate the additive approach with some notional examples drawn from Hosek, Mattock, and Asch (2019). The first example is that of a Navy nuclear-qualified submarine officer. Figure 7.10 shows the S&I pays such an officer might receive, including incentive bonus, submarine pay, sea pay, an accession bonus, and a pay that is contingent on a multiyear obligation (the Nuclear Officer Continuation Bonus). Figure 7.11 shows the case where the incentive bonus, submarine pay, sea pay, and the accession bonus are consolidated into

FIGURE 7.10

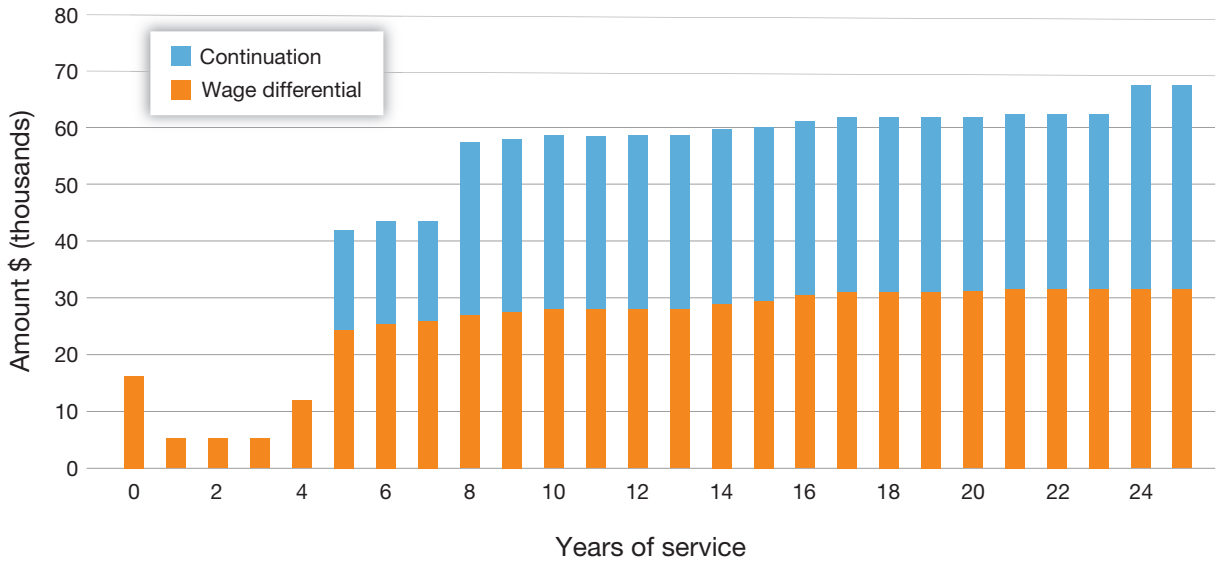
Notional Example of Nuclear-Qualified Submarine Officer Special and Incentive Pay



SOURCE: Reproduced from Hosek, Mattock, and Asch, 2019.

FIGURE 7.11

Notional Example of Nuclear-Qualified Submarine Officer Special and Incentive Pay Under an Additive Approach to a Wage Differential



SOURCE: Reproduced from Hosek, Mattock, and Asch, 2019.

a wage differential added to basic pay, leaving out the incentive pay associated with a longer obligation. The pays aggregated into the wage differential are consistent with the criteria noted above: they are stable over time, they are scheduled to a particular point in a career, they do not involve an incentive to select a longer obligation, and they are not conditional on the realization of certain military circumstances.

The notional examples depicted in Figures 7.12 and 7.13 show the consolidation of Aviator Career Continuation Pay (now the AvB) and the Aviation Command Retention Bonus into a single pay that depends on a service obligation. Aviation Career Incentive Pay (ACIP; now called Aviation Incentive Pay [AvIP]) would be the wage differential that would be added to the basic pay table to form the new occupation-specific pay table.

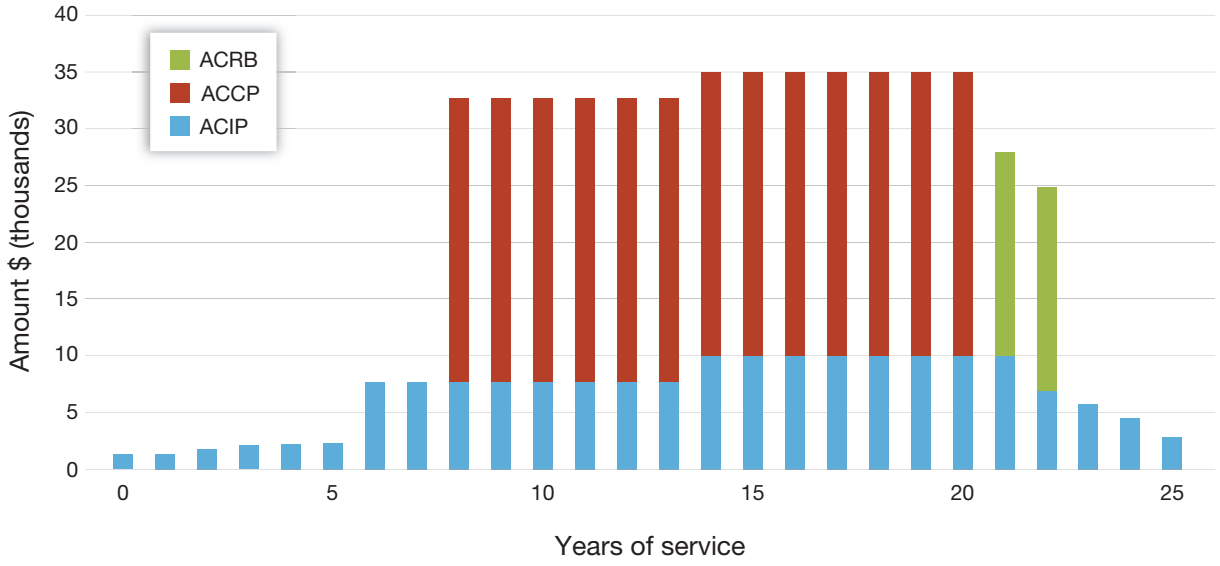
The notional examples in Figures 7.12 and 7.13 show where existing S&I pays could be aggregated to form the initial wage differential that would be added to the baseline basic pay table to form an occupation-specific pay table. Over time, any given wage differential would need to be adjusted, just as the separate S&I pays are now. The task of adjusting an occupation-specific wage differential might prove to be more difficult than that of adjusting the individual component S&I pays that were aggregated to form the wage differential. Individual S&I pays are well understood, can be comparable among the services, and have some associated institutional history and precedent. These aspects of S&I pays facilitate discussion and adjustment of the individual pays. The wage differential, unless it is created by simply renaming a single existing S&I pay, as in the Navy aviation example above, may need to perform several conceptually different functions, thus making it more difficult to manage.

One disadvantage of an occupation-specific pay table approach is that it is less flexible than the current system of S&I pays; it would not be able to target incentives as effectively. For example, the pay table that would result from the first example (Navy nuclear-qualified officers) would result in the officers receiving the same pay whether they were at sea or on shore. Thus, this incentive for sea duty provided by the receipt of sea pay being contingent on actually being at sea would be lost.

On the other hand, one advantage of an occupation-specific pay table approach is that it would help to address stovepiping of pay management, where individual S&I pays are managed by different communities

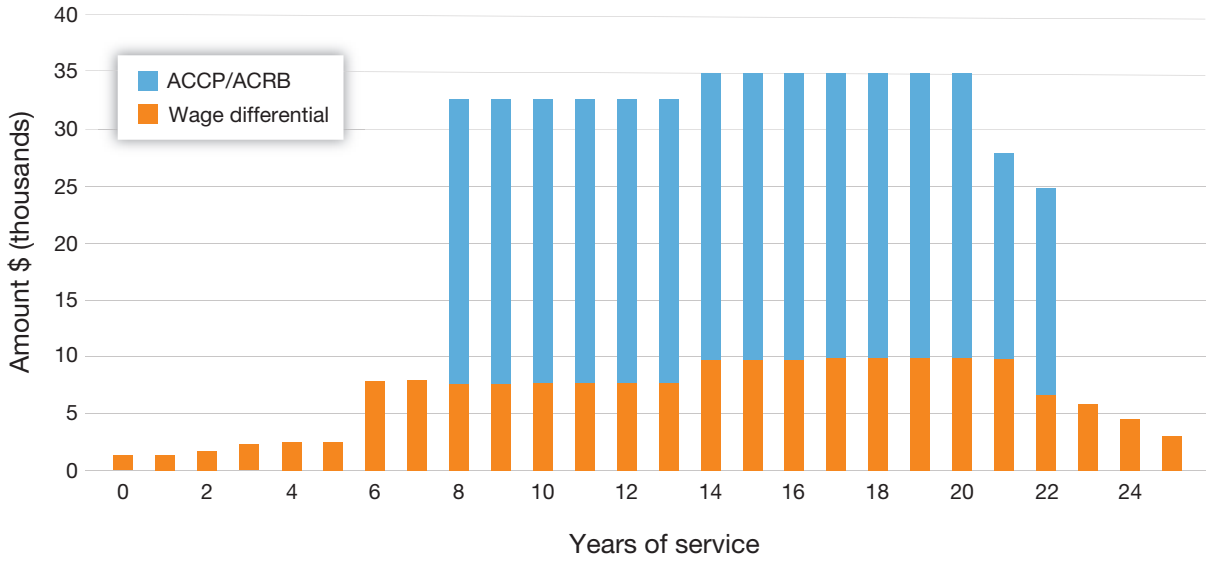
FIGURE 7.12

Notional Example of Navy Fighter Pilot Special and Incentive Pay



SOURCE: Reproduced from Hosek, Mattock, and Asch, 2019.

FIGURE 7.13
Notional Example of Navy Fighter Pilot Special and Incentive Pay Under an Additive Approach to a Wage Differential



SOURCE: Reproduced from Hosek, Mattock, and Asch, 2019.

who may be unaware of developments outside their particular remit, leading to unintended consequences when service members receive multiple S&I pays simultaneously.

The Multiplicative (or Coefficient) Approach

Figure 7.14 shows pilot compensation with AvIP, which is paid unconditionally, and AvB, which is conditional on a longer obligation. The blue line shows how AvIP could be approximated by a linear function of basic pay.

In Figure 7.15 we show an example where the wage differential is a linear approximation of AvIP, 0.0315 × (baseline monthly basic pay) + 317. In this case, the occupation-specific pay table would be defined as 1.0315 × (baseline monthly basic pay) + 317. That is, each entry of the basic pay table would be multiplied by 1.0315 and have the constant $317.00 added to it.

It would be inefficient to incorporate all S&I pays into the pay table approach. Some S&I pays currently, such as AvB, require a service obligation. The obligation would be eliminated if the pay were instead incorporated into the pay table, but pay would have to be increased to achieve the same retention effect. However, it would be less efficient. The cost of unconditional pays to induce the same retention effect as offering a pay that has a service obligation could be considerably higher. Costs increased by 166 percent in an example of Air Force pilot retention presented in Hosek, Mattock, and Asch (2019). In addition, including S&I pays to compensate ex ante for realization of certain military circumstances would be less efficient than compensating ex post (e.g., Hostile Fire Pay, Imminent Danger Pay) when uncertain events (such as exposure to risk) are realized. However, if exposure to risk is certain (as in an inherently hazardous occupation) then it *can* be efficient to offer a compensating differential (Hosek, Mattock, and Asch, 2019).

Comparing the two pay-table based approaches, the additive approach could initially be implemented for selected occupations using current S&I pays as a guide. However, thereafter the additive wage differential would be subject to the same difficulties as setting current S&I pays in determining the appropriate levels.

The multiplicative approach is appealing in its apparent simplicity, but the version considered here also shows some of the limitations if this approach is solely confined to simple linear functions of the baseline

FIGURE 7.14
Notional Example of Department of the Air Force Pilot Special and Incentive Pay

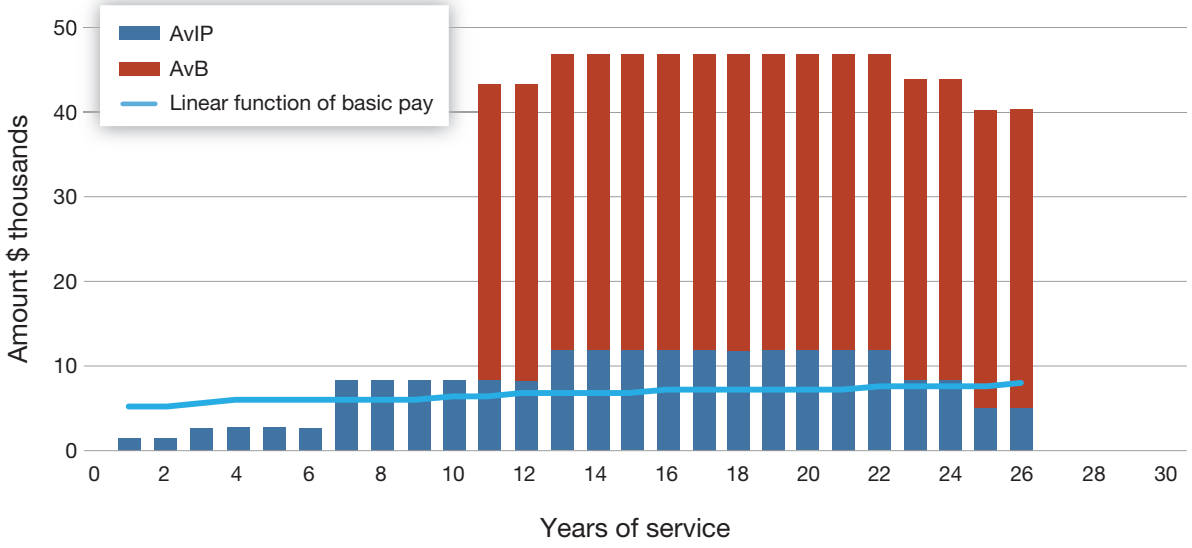
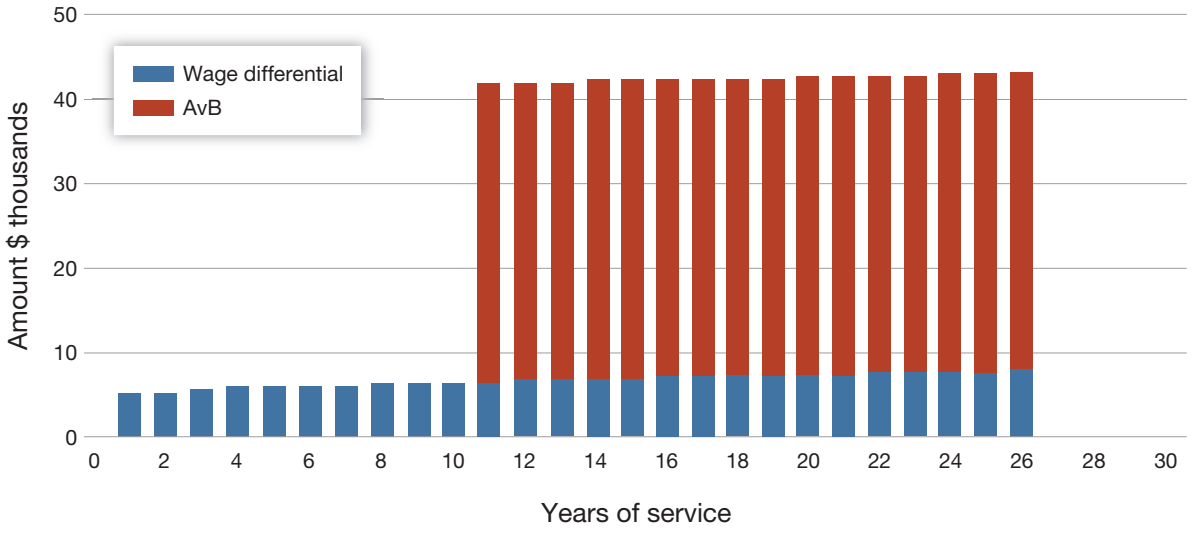


FIGURE 7.15
Notional Example of Department of the Air Force Pilot Special and Incentive Pay Under a Multiplicative Approach to a Wage Differential



basic pay table. For example, the linear approximation of AvIP deviates substantially from the actual AvIP in the early part of the career.

Both approaches have the characteristic that they could be adjusted in the normal course of updating the baseline basic pay table. The additive wage differential could be raised or lowered, as circumstances require. The coefficients in the multiplicative approach could also be adjusted; if it were not adjusted, the first term of the linear expression would increase by the same percentage as the basic pay table, while the constant term would remain the same, resulting in a net percentage increase somewhat less than that applied to the basic pay table. This, however, is no worse than the current situation, where many S&I pays are stated

in nominal values that are not frequently updated, resulting in a reduction in the real value of the pays over time due to inflation. This should not be read as implicitly advocating that S&I pays should be indexed (e.g., to the CPI-U); instead they should be reviewed and adjusted as frequently as needed to ensure that they retain their functionality as a means of ensuring adequate retention. That is, pays should be adjusted as needed to retain their *incentive value* rather than their real value, which may require increases more—or less—than that required to retain their real value.

Both approaches would change the basic pay table for selected occupations, as well as all forms of compensation linked to the basic pay table, such as the defined benefit component of the military retirement system, disability retirement, and disability severance pay.

Chapter Summary

In Table 7.2 we give the key findings corresponding to each research question, and in Table 7.3 we give the implications corresponding to each policy question. In brief, we find that S&I pays are highly targeted, with few occupations receiving large amounts of these pays. Cash compensation is uniformly higher in

TABLE 7.2
Summary of Findings

Research Questions	Key Findings
1. What is the prevalence of critical specialties, and how much is cash compensation higher owing to receipt of S&I pays?	• S&I pays are highly targeted: a small share of occupations show a high incidence of S&I pays • Few occupations receive large amounts of S&I pays
2. Does the evidence indicate that the current S&I pay system is adequate for providing wage differentials?	• Cash compensation is uniformly higher in critical skills • Research shows that S&I pays are effective as accession and retention incentives, and they are cost-effective, but the research has key gaps • SMEs generally favored the current S&I pay approach for setting wage differentials
3. What might a pay table approach to offering wage differentials for critical skills look like, and what are the advantages and disadvantages of a pay table approach?	• Both the additive and multiplicative approaches have advantages • Consolidating S&I pays that currently require a service obligation would be inefficient

SOURCE: Authors' analysis and interviews with SMEs.

TABLE 7.3
Policy Implications

Policy Questions	Findings and Implications from the Analysis
1. Does the need for higher pay in critical skills occur broadly across the force?	• No. S&I pays are highly targeted, and relatively few occupations receive large amounts in S&I pays.
2. Does the current system of supplementing basic pay with bonuses and special pays adequately address the need for wage differentials for these specialties?	• Yes. SMEs generally favored the current S&I pay approach for setting wage differentials, and research shows that these pays improve readiness and are cost-effective. Even so, the SMEs and the literature review identified areas where S&I pays might be improved, though more analysis is needed for specific recommendations.
3. Should the pay table be modified to provide wage differentials for critical specialties?	• Not at this time. While some S&I pays might be consolidated into a wage differential, pays that depend on a service obligation are more efficient that those that are not, and these pays should not be consolidated into a wage differential.

SOURCE: Authors' analysis and interviews with SMEs.

critical skills, and SMEs generally favored the current S&I approach for setting wage differentials by occupation; using a pay table approach to establish wage differentials has advantages and disadvantages, and consolidating those pays that currently have an associated service obligation into a wage differential would be inefficient. In response to the policy questions, we find that higher pay for critical skills does not occur broadly across the force. S&I pays are highly targeted, with few occupations receiving a high amount. The current system of S&I pays can adequately address the need for wage differentials in critical skills occupations and, at this time, the pay table should not be modified to provide wage differentials for critical specialties.

CHAPTER 8

Conclusions

This report summarizes analyses we conducted in support of the 14th QRMC's review of the basic pay table; these analyses included an update and assessment of the 70th percentile benchmark used by Congress and DoD to judge the adequacy of level of military pay, a review of officer and enlisted basic pay, an evaluation of the ECI and alternatives as guides to the annual basic pay adjustment, and an assessment of pay for service members in critical specialties. Our main conclusions are summarized in this chapter.

The 70th Percentile Benchmark

Whether military pay levels are adequate must be judged not on how military pay compares with civilian pay but on whether the services are able to recruit and retain the personnel needed to meet their manpower objectives. Recent retention trends indicate that the services have experienced strong retention overall, generally reaching at least 100 percent of their active duty reenlistment mission among service members ending their initial obligations and those in midcareer. Officer retention has been strong as well. Recruiting has been challenging in recent years in terms of missed accession goals, though recruit quality has remained high overall. While research shows that recruiting is responsive to increases in military pay relative to civilian pay, the recent recruiting challenges do not provide a compelling reason to increase military pay relative to civilian pay given that retention has been strong and the services have more efficient means of improving recruiting that they are pursuing, including increasing advertising and numbers of recruiters.

While the adequacy of military pay should be judged ultimately on readiness outcomes, since the 9th QRMC in 2002 both Congress and DoD have used the 70th percentile of civilian earnings as a benchmark to consider the adequacy of RMC. Using 2017 data, the 13th QRMC found that the weighted average of enlisted RMC from zero to 20 YOS was at the 84th percentile of comparable civilians, while officer RMC was at the 77th percentile. We updated these computations using 2021 data and found virtually identical results. The weighted average of enlisted RMC between zero and 20 YOS was at the 83rd percentile, while the weighted average of officer RMC over these YOS was at the 76th percentile. Thus, average RMC continues to be well above the 70th percentile.

We also considered the question of whether the 70th percentile benchmark should be changed. We find that average RMC has exceeded the 70th percentile since the late 1990s, when the 70th percentile was established, owing to the faster-than-ECI pay raises that occurred in the early 2000s, raising the question of whether the percentile benchmark should be increased. We considered recruiting and retention outcomes since the late 1990s and found that, relative to the earlier periods corresponding to the data periods that were the basis for the establishment of the 70th percentile, recruit quality has remained relatively unchanged in recent years, and retention has been stronger, though recruiting and retention resources have increased over time and some conditions have improved. For example, end-strength targets are significantly lower than in the late 1980s and mid-1990s, reducing accession and retention objectives and the overall demand for manpower. Furthermore, the services are fielding larger recruiter workforces than in earlier periods, and service

members are experiencing fewer deployments overall in recent years relative to earlier periods. Furthermore, active duty members report fewer duty days when they work overtime. On the other hand, several factors that affect recruiting and retention outcomes have become more challenging. Fewer young people express an interest in military service, the share of young people qualified for service has been declining over time, and low unemployment has meant robust civilian labor market opportunities overall. Furthermore, the share of active duty members who express satisfaction with the military way of life has drifted downward over time, as have the share of spouses who support their spouses staying in the military.

These challenges suggest that aspects of recruiting and possibly the retention market have become more difficult than in the periods that were used to establish the 70th percentile benchmark, and many of the factors do not appear to be transitory—a conclusion we also reached in our earlier analysis (Asch et al., 2020). On the other hand, other aspects have become easier, including lower recruiting and retention objectives. Nonetheless, these challenges suggest that an RMC percentile benchmark above the 70th could be appropriate, though we reiterate that other policies, such as a greater number of recruiters and increased advertising, are more cost-effective than pay in addressing recruiting challenges. We do not have a specific number to offer in terms of a new benchmark, but a figure of around the 75th to 80th percentile for enlisted personnel and around the 75th percentile for officers might likely be in the right ballpark. In considering a higher benchmark for enlisted members and officers, future QRMCs should be required to periodically revisit any new benchmark to ensure that it remains relevant as an early warning system of potential issues with the level of military pay relative to civilian pay.

Junior Enlisted Basic Pay

Food insecurity among military personnel (especially among junior enlisted members), recent recruiting difficulties, and rapid inflation since 2020 have put a spotlight on junior enlisted pay. In the spring of 2023 Congress put forward two proposals to increase junior enlisted basic pay, and in the winter of 2024 the House of Representatives' Quality of Life Panel also argued for a junior enlisted basic pay increase. We find that because of rapid promotion in the first year of service, enlisted pay in the first year exceeds the pay of an E-1, and some recruits enter the military above the grade of E-1. Furthermore, basic pay grows substantially over the first enlistment term because of promotions and longevity increases, and RMC for junior enlisted members exceeds the FPL, even for large families.

We assessed the two congressional proposals together with four additional proposals in terms of their expected effects on pay levels, pay compression of the basic pay table, high-quality enlistments, retention, personnel cost, and efficiency. We find that none of the proposals dominates in terms of its effects on all the factors we considered. The proposals with the largest pay increases had the largest effects on recruiting and retention but also were the most costly. The two congressional proposals compressed the pay table the most relative to the pay of midcareer and senior enlisted personnel, and these proposals were among the least efficient. The least costly proposal we considered had a small effect on recruiting and retention and was the least efficient proposal we considered.

Thus, the best proposal depends on the problem that DoD is trying to solve. If food insecurity is the problem, our initial tabulations suggest that nonpay assistance may be necessary. We tabulated the relationship between military pay and food insecurity by merging information on food insecurity from the 2020 SOFS-A with DMDC pay records of respondents. We do not find a statistically significant relationship between average military cash compensation and likelihood of being food insecure in the survey for junior enlisted personnel, though we do not hold constant other factors that could be important.

Similarly, if DoD is seeking to improve recruiting outcomes, research shows that raising basic pay is the least cost-effective means of doing so relative to advertising, recruiters, and even enlistment bonuses. Raising

pay is a permanent policy that affects pay in future years and affects other personnel costs, including retirement accrual costs. Increasing basic pay to address recruiting challenges only begins to make sense when the DoD is also facing retention challenges, which is currently not the case.

Midcareer and Senior Enlisted Basic Pay

In our evaluation of midcareer and senior enlisted basic pay, we first considered whether the level of military pay seemed adequate for these personnel by examining whether the services were meeting their overall retention objectives for these personnel and whether the levels of RMC compared well relative to the earnings of similar civilians. We found that overall retention is strong for enlisted personnel, though the services report areas of challenges in specific communities, such as aviators, that are typically addressed with S&I pays. Furthermore, as we have shown, average RMC exceeded the 70th percentile benchmark for enlisted personnel.

That said, discussions with SMEs revealed two areas of concern regarding midcareer and senior enlisted basic pay. The first area was related to performance incentives embedded in the pay table and the financial reward associated with promotion—the primary means by which better performance is financially recognized. A consistent theme we heard was that pay is only weakly related to performance and that pay increases associated with promotion are not always adequate. Another theme we heard related to performance is that E-9s are promoted around the 21st year of service, but those who stay until 30 or 40 YOS have no further promotion opportunities.

The second area of concern was the relationship between officer and enlisted basic pay and the increasing absolute gap over time between them. A related concern was that enlisted jobs have changed over time, involving more responsibility than in the past, and that midcareer and senior enlisted members are paid less than officers with similar responsibilities. Some SMEs recommended capping the difference between officer and enlisted pay and paying personnel based on job skills and responsibility.

We evaluated four proposals that would restructure the basic pay table for midcareer and senior enlisted personnel to increase incentives for performance. The proposals would also structure the pay table in a way that is more in accord with the implications of the personnel economics literature, which finds that the optimal structure of compensation across hierarchical levels is one where the pay increase associated with promotion is larger for more senior promotions. The increase in compensation can take forms other than cash compensation, including expected retirement benefits or noncash compensation. Three of the proposals would add an E-10 grade to provide promotion opportunities for E-9s, a proposal that was also considered by the 9th QRMC.

We find that all four proposals would improve retention and performance incentives but would also increase personnel costs, with larger effects for the proposals that increase basic pay the most. The proposals with the largest effects are ones that target pay raises to the grades of E-6 to E-9, with one of the proposals adding an E-10 grade and one that does not. While adding an E-10 grade is predicted to increase performance incentives, doing so could involve considerable implementation costs because new manpower requirements would need to be defined and validated and new promotion criteria would need to be defined.

Linking Enlisted Basic Pay to Officer Basic Pay

To analyze the issues raised by some SMEs regarding the relationship between enlisted and officer basic pay, we considered the experience of the civilian labor market and reviewed the available literature pertaining to this issue. There has been extensive research on pay disparities in private-sector firms, with the literature becoming more salient due to passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2015, which requires firms to report pay disparities between upper management and the average employee.

Research on private-sector firms provides evidence that larger firms pay higher wages, especially to their chief executives, and have larger pay disparities between employees across hierarchical levels. Studies also find that firms with larger pay disparities have stronger operating performance, higher valuations, and larger equity returns. These results are consistent with the hypothesis that larger firms require more managerial talent at the top to be successful and thus require higher pay and compensation to attract and retain that talent. An implication of these results is that capping pay differences would hurt firm performance by inhibiting the ability of firms to attract and retain better talent at the higher hierarchical levels. Some research also finds that pay disparities do not adversely affect employee output, attendance, and group cohesion unless workers perceive that higher-paid peers are not more productive. It also finds that employees are motivated by higher-paid managers but demotivated by higher-paid peers in the same unit and same position.

The implication of this research is that capping the differences would likely hurt military organizational performance by hurting the ability of the services to attract and retain higher-quality personnel who will eventually fill upper-ranked managerial positions. Capping differences could result in pay that is too high for some personnel (and excessively costly for the military) and too low for other personnel.

We also considered the literature on paying people with similar job responsibility and skill the same amount, a concept known as comparable worth in the labor economics literature. This approach to paying people had some interest in the 1980s and 1990s, especially as a means of reducing pay differences between those in female-dominated occupations like teaching versus male-dominated occupations, but it has lost popularity since then. Critics did not favor comparable worth because it would substitute job content for market conditions in setting pay and ignore the supply and demand factors that influence pay levels in the market. Ignoring these factors in the pay-setting process could produce retention problems in some cases or an oversupply of people in other cases. It also lost favor among proponents because although comparable worth policies increased pay in female-dominated occupations, they also reduced employment and ultimately did not eliminate pay disparities because such disparities were due to other factors.

The implication of comparable worth for setting enlisted versus officer pay is that it would move the pay-setting process away from such considerations as retention, recruitment, motivation, and the other principles of military compensation that have guided the setting of military pay for decades. It would de-emphasize career progression considerations that are specific to the enlisted force versus the officer force and could result in talent management difficulties or inefficiencies because it could result in pay that is too high for some parts of the force and too low for others. Further, it would require an extensive and objective job evaluation process that could be difficult to implement given the challenges of measuring military productivity.

Commissioned Officer Basic Pay

Officer retention has historically been strong in recent years, and average RMC among officers compares well relative to civilian pay based on our updated analysis of the RMC benchmark. Nonetheless, some of the SME discussions we held raised concerns about the adequacy of performance incentives in the officer pay table—especially for midcareer officers and very senior officers. They also raised concerns about the lower pay for lateral entrants relative to officers in the same grade who entered as O-1s, thereby making lateral entry relatively less attractive as a career alternative.

We evaluated three proposals to increase performance incentives that targeted basic pay raises to midcareer officer grades, with one proposal also raising basic pay for very senior officers by lifting the basic pay cap to the ES-I level. We find that the proposals would increase performance incentives in the midcareer and senior officer grades and would improve retention, with a modest increase in cost. We note that the analysis did not estimate the value created for the services of the increased performance incentives.

Research for the 13th QRMC analyzed the advantages and disadvantages of a time-in-grade pay table relative to the current time-in-service pay table. One advantage of a time-in-grade pay table shown in that research is that it could increase the attractiveness of lateral entry by raising entry pay for lateral entrants relative to their pay under the current time-in-service pay table. However, that research also showed that it would be possible to replicate the advantages of a time-in-grade table for lateral entrants by expanding the definition of constructive credit to include YOS. Thus, lateral entrants could enter service not only at a higher pay grade but also at a higher year of service. Such a constructive credit policy would enable the services to increase the attractiveness of lateral entry under the current time-in-service pay table.

The Employment Cost Index and the Annual Basic Pay Adjustment

Rapidly rising inflation since 2021 has brought attention to the annual military pay raise because of concerns that lags in the annual adjustment would result in a decline in real military pay. The ECI used to guide the annual pay adjustment is computed 15 months before the military pay raise in January, and it is backward-looking in the sense that the change in the ECI is measured relative to 12 months earlier. When inflation is increasing rapidly, the 15-month lag and the backward-looking focus mean that the pay raise will not reflect all of the changes in cost of living between one pay raise and the next.

We evaluated the ECI—as well as several alternatives, including the DECI—in terms of accuracy, timeliness, cost-effectiveness, and credibility. The ECI captures broad changes in the civilian labor market in general, and to the extent that service members make retention decisions based on the civilian labor market in general, the ECI would capture these civilian earnings. The ECI is highly credible, since it is computed by the BLS, and it is cost-effective to the extent that DoD does not incur the cost of computing it. On the other hand, the 15-month lag hurts the timeliness of the ECI, and this affects service members during times of inflation.

The DECI is an index developed in the 1990s by RAND and evaluated for the 13th QRMC. The advantages of the DECI are that it takes perspective civilian employees, rather than employers, and focuses on the labor market opportunities of civilians who have similar characteristics as military personnel, thereby more accurately reflecting the external market as service members make retention decisions. The disadvantages of the DECI are that it is subject to more volatility than the ECI during times of significant churn in the labor market, and it would have to be computed by DoD or some external entity, thereby potentially calling its credibility into question by some stakeholders. Further, it would also be subject to a 15-month timeliness lag.

We also consider the CPI, a metric on inflation, as a potential alternative to the ECI given concerns about recent inflation. We found that changes in the CPI miss changes in civilian wages due to increases in worker productivity. The CPI has grown more slowly than the ECI since 2000, implying that military personnel would have missed out on significant pay raises and that the services might potentially have experienced significant recruiting and retention challenges. We considered a forecast of the ECI produced by the CBO as a means of improving timeliness, but we found that the forecast is only produced on an ad hoc basic and is less accurate at predicting the future ECI than the ECI currently used to guide the military pay raise.

Finally, we considered an alternative that would rely on a more recent ECI to inform the pay raise, thereby reducing the time lag from 15 months to six months or less, but which would use the usual ECI for budgeting purposes. This alternative would improve the timeliness of the pay adjustment guidance and have the other advantages of the ECI. However, it would also mean that the ECI used for the pay raise would be out of sync with the budget process, and if the ECI used for budgeting differed from the ECI used for the pay raise, DoD will find it has either a budgeting shortfall or overage. We estimated that the size of these shortfalls or overages were relatively small until 2022. When inflation increased, we found DoD would have faced a shortfall of approximately $340 million in 2022 and about $480 billion in 2023.

Pay for Critical Skills

Retention of service members in critical occupational specialties is vital to the mission of the military. This was recognized in NDAA 2023; Section 643 of H.R. 7900 required a study of basic pay to assess whether to modify the current basic pay tables to provide higher rates of pay, or whether employing the current system of S&I pays adequately addresses the need for "wage differentials" for critical occupations. In addition, Section 643 also mandated that the assessment "consider the degree to which the need for higher rates of pay for critical occupational specialties occurs broadly across the Force."

We considered three policy questions that were motivated by the legislative language in Section 643:

1. Does the need for higher pay in critical skills occur broadly across the force?
2. Does the current system of supplementing basic pay with bonuses and special pays adequately address the need for wage differentials for these specialties?
3. Should the pay table be modified to provide wage differentials for critical specialties?

To help answer these policy questions, we took a data-driven approach informed by SME discussions and a literature review to consider three related research questions:

1. What is the prevalence of critical specialties, and how much is cash compensation higher owing to receipt of S&I pays?
2. Does the evidence indicate that the current S&I pay system is adequate for providing wage differentials?
3. What might a pay table approach to offering wage differentials for critical skills look like, and what are the advantages and disadvantages of a pay table approach?

We first discuss the findings for the research questions, and then the policy questions. With respect to the first research question, on prevalence, we found that S&I pays are highly targeted, with only a small share of occupations showing a high incidence of S&I pays, and also that few occupations receive large amounts of S&I pays. For the second research question, on the adequacy of S&I pays in providing wage differentials for critical skills, we found that cash compensation is uniformly higher for critical skills. In addition, we found that previous research shows that S&I pays are effective as accession and retention incentives and cost-effective, but research has gaps in some key areas, such as whether some S&I pays are set too high or too broadly, resulting in the services paying economic rents. Furthermore, the SMEs we interviewed generally favored the current S&I pay approach to setting wage differentials. Finally, for the third research question, on the advantages and disadvantages of different pay table approaches to giving a wage differential, we found that both approaches we considered had advantages, as they are both conceptually simple extensions of the existing pay table and they could potentially both help to address stovepiping of S&I pay management that could lead to unintended consequences when service members receive multiple S&I pays simultaneously for essentially the same thing. However, we also found that consolidating S&I pays into the pay table that currently require a service obligation would be inefficient.

Based on our research findings, we were able to address the policy questions. With respect to the first policy question, as to whether the need for higher pay in critical skills occurs broadly across the Force, we found that the answer was "No": S&I pays are highly targeted, with few occupations receiving a large amounts in S&I pays. For the second policy question, as to whether the current system of S&I pays can adequately address the need for wage differentials in critical skills occupations, the answer was "Yes": SMEs generally favored the current S&I pay approach for setting wage differentials, and research shows that these pays improve readiness and are cost-effective. Even so, the SMEs and the literature review identified areas where S&I pays might

be improved (pays are not necessarily well-coordinated when service members are eligible for multiple pays; pays are adjusted infrequently; those stated in nominal dollar values may inadvertently decay in value over time), though more analysis is needed for specific recommendations for improvement. Finally, with respect to the third policy question, as to whether the pay table should be modified to provide wage differentials for critical specialties, the answer is "Not at this time." While some S&I pays might be consolidated into a wage differential, pays that currently depend on an additional service obligation are more efficient that those that are not, and these pays should not be consolidated into a wage differential.

Wrap-up

A periodic review of the military pay table is important to ensure the continued success of the AVF and the ability of the services to attract and retain the quality and quantity of personnel they need. Our review focused on issues raised in the charter of the 14th QRMC, in Section 643 of H.R. 7900 of the NDAA for FY 2023, and in SME discussions. We find that none of the proposals to increase junior enlisted basic pay emerged as uniformly better in terms of its recruiting, retention, cost, efficiency, and pay compression effects relative to the baseline. This raises the question of whether other, more targeted and tailored, policies would be more effective and efficient. For example, pay is a blunt and costly instrument for addressing recruiting challenges that can be more effectively and efficiently addressed by the types of policies the services have recently been pursuing, such as increasing the number of recruiters and improved marketing and advertising.

SMEs raised concerns about the weak link between pay increases and performance in the pay table for career enlisted members and for commissioned officers. We considered proposals that would restructure the pay table for each group to provide successively larger pay bumps associated with promotion, including adding a new E-10 grade, and find that these proposals would improve retention and performance incentives but also modestly increase personnel costs. Adding an E-10 grade could involve significant implementation costs, a factor that we did not consider in our cost analysis. The analysis also did not delve into whether the current procedures for evaluating performance are comprehensive and reliable across personnel being evaluated. Some personnel might believe that the performance evaluation process does not capture the range and quality of their contributions; therefore, they might perceive their pay increase as too low. More broadly, the report considers pay table changes to create stronger incentives, and other factors, such as the validity of the performance evaluation process, may be pertinent to strengthening the link between pay and performance. We find that linking enlisted pay with officer pay, whether to address pay inequality or to better reflect similar job content among enlisted members and officers, would move the setting of military pay away from the market-based principles that have guided the setting of such pay successfully over the course of the AVF and could result in recruiting and retention problems.

Overall, we find that the ECI has functioned well as a guide to pay adjustment, though using a more recent ECI would help address concerns about the time lag. The DECI has the advantage of providing information about the labor market opportunities specific to people who have characteristics similar to those in the military and could be used as a supplement to the ECI, especially when Congress and DoD are considering deviating from the ECI guidance.

Finally, we find that the services use S&I pays to create pay differentials, whether as a recruiting or retention incentive or to recognize unusual or hazardous duties or persistent better external market opportunities. While some S&I pays might be better consolidated, it is important that any such consolidation does not adversely affect the efficiency or effectiveness of these pays.

APPENDIX A

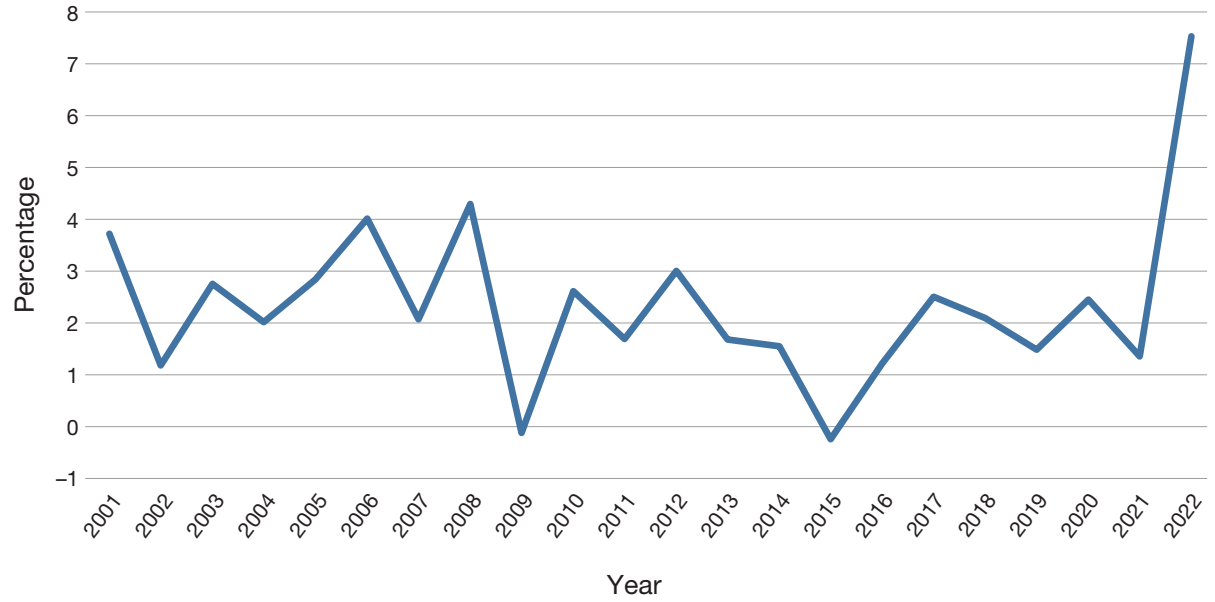
Trends in the Civilian Labor Market

This appendix provides an overview of trends in the civilian labor market. We begin with a review of how inflation has changed, and then turn to a review of broad changes in labor market activity as measured by the unemployment rate, LFP, the employment rate, and measures of nontraditional employment (such as gig work) and part-time work. We then examine changes in factors that underlie these broad changes related to the supply of and demand for labor, drawing from analyses we conducted of publicly available data sources and from a review of research that has considered the extent to which these supply and demand factors explain the changes in LFP and the employment rate. We conclude with a discussion of how the COVID-19 pandemic affected civilian employment and emerging trends, such as working from home, that may be a permanent feature of the labor market.

Inflation

Figure A.1 shows that overall inflation, as measured by the CPI-U, has historically hovered between 0 and 4 percent since 2000, with steep growth occurring during the pandemic and its aftermath, rising to 7.5 percent in 2022. Figures A.2 and A.3 show the increase in food, rent, and energy prices beginning in 2001, with

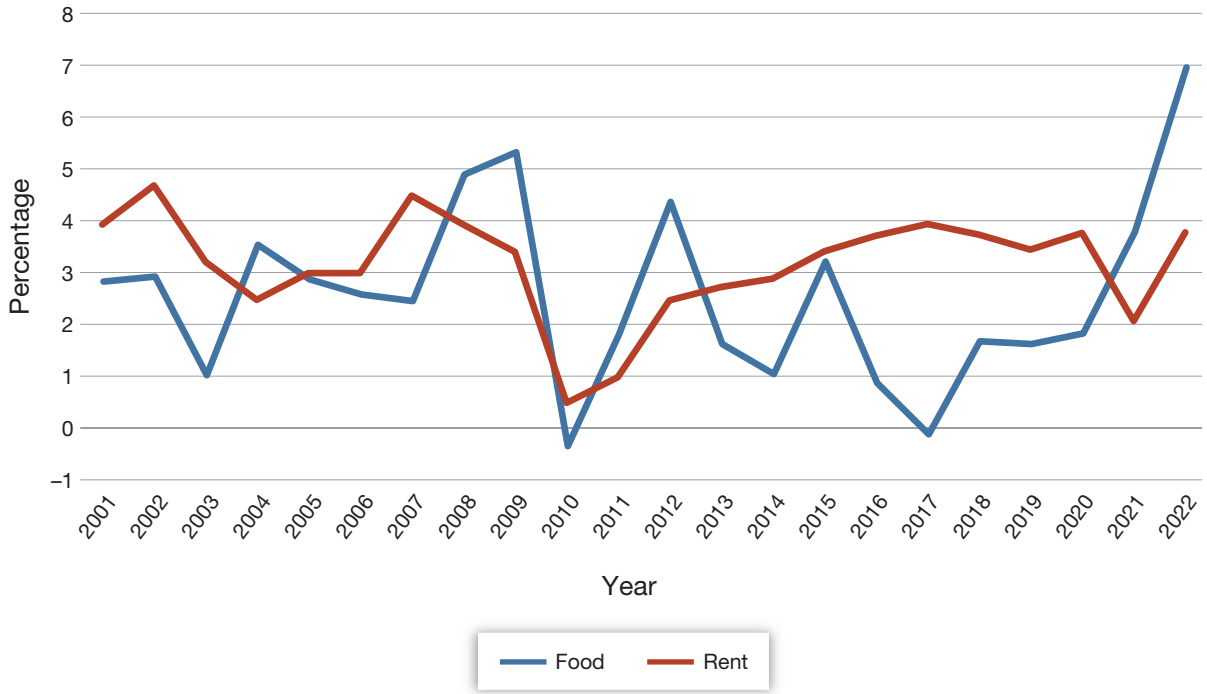
FIGURE A.1
Percentage Change in the CPI-U, 2000–2022



SOURCE: Federal Reserve Bank of St. Louis (undated c), CPI-U, seasonally adjusted.
NOTE: The figure measures annual change from January of one year to January of the next.

FIGURE A.2

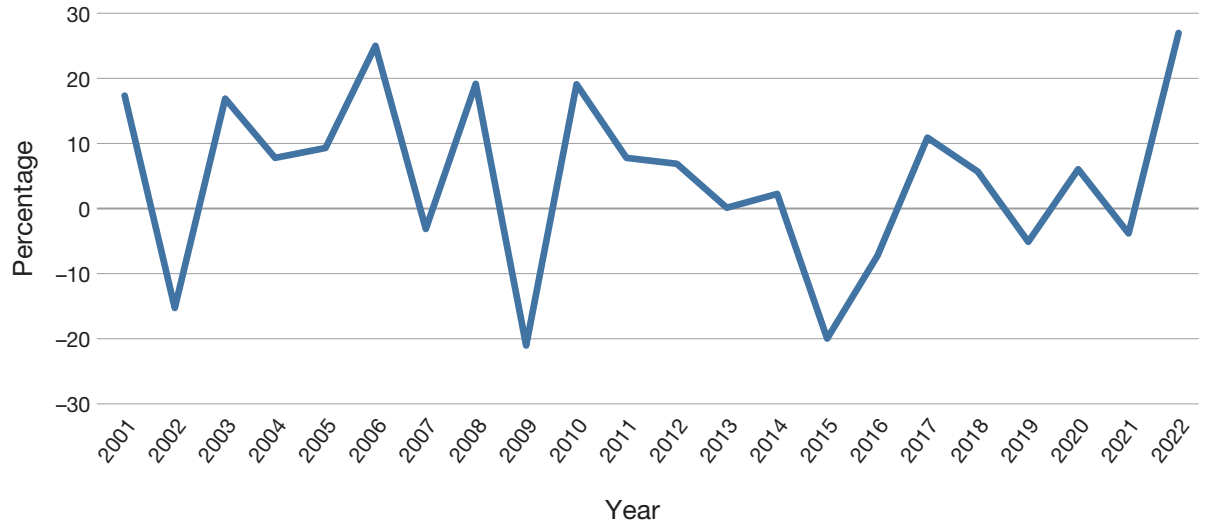
Percentage Change in Food and Rental Prices, 2000–2022



SOURCE: BLS (undated b), CPI-U, food and rent for primary residence in U.S. city average, seasonally adjusted.
NOTE: The figure measures annual change from January of one year to January of the next.

FIGURE A.3

Percentage Change in Energy Prices



SOURCE: BLS (undated b), CPI-U, energy in U.S. city average, seasonally adjusted.
NOTE: The figure measures annual change from January of one year to January of the next year.

Figure A.2 showing increases in food and rental prices in 2022. Inflation varies by local geographies, suggesting that the purchasing power of both military and civilian pay in terms of real income will depend on where people live (see Table A.1). The five metropolitan areas with the largest increases in inflation were Miami, Tampa, Phoenix, Dallas, and Seattle, with inflation rising between 8.4 and 9.9 percent. The five metropolitan areas with the smallest increases in inflation were Anchorage, Minneapolis, Houston, Los Angeles, and San Francisco, with inflation rising between 4.9 and 5.4 percent.

Given the rapid increase in inflation in recent years, there has been renewed interest in the methodology used to annually adjust military basic pay. We conduct an assessment of the methodology and consider alternatives to the current methodology, including using the CPI as the guide for the annual adjustment, in Chapter 6.

TABLE A.1
Metropolitan Areas with the Five Largest and Five Smallest Percentage Changes in Inflation

Metropolitan Area	12-Month Percentage Change in Inflation
Largest	
Miami	+9.9%
Tampa	+9.6%
Phoenix	+9.5%
Dallas	+8.4%
Seattle	+8.4%
Smallest	
Anchorage	+5.4%
Minneapolis	+5.3%
Houston	+5.3%
Los Angeles	+4.9%
San Francisco	+4.9%

SOURCE: BLS (undated b).

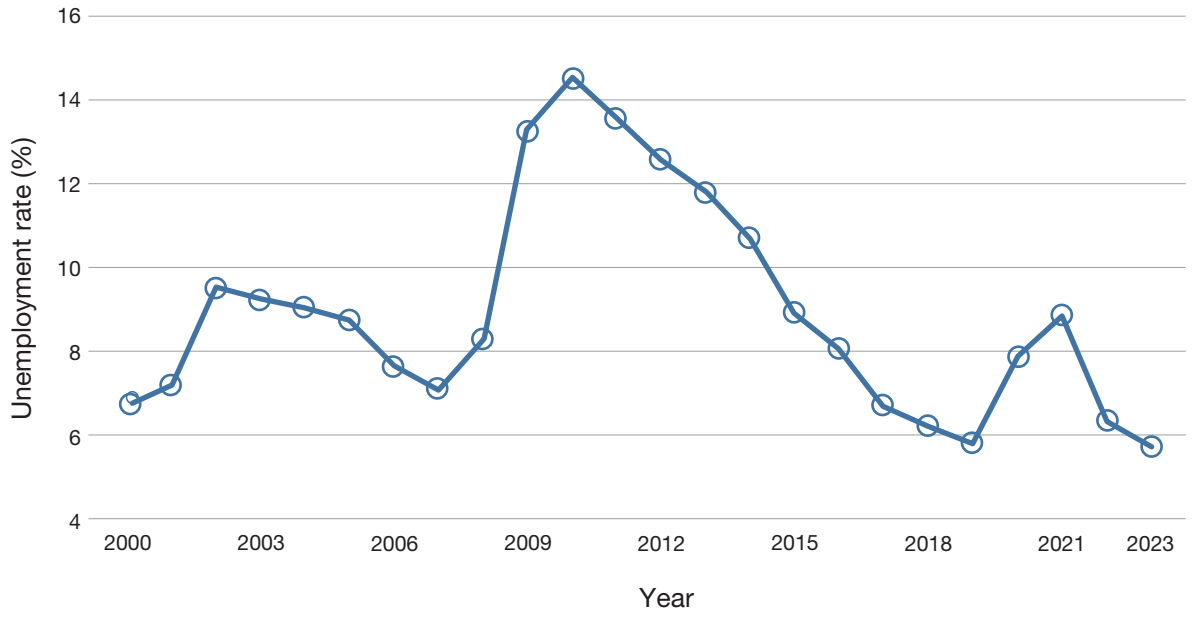
NOTE: Figures are for the most recent 12 months of data available (as of November or December 2022).

Unemployment, Labor Force Participation, Employment, and Nontraditional Employment

Using data from the CPS, we computed the unemployment rate for individuals ages 18–30 from 2000 to 2023, as was shown in Figure A.4. We focus on ages 18–30 because this age range is the group from which the military primarily recruits and retains individuals given that most recruits and enlisted personnel are under age 30. (Older military personnel including officers also make retention decisions, but their retention rates are higher.) The figure shows the sharp increases in the unemployment rate for this age group during the Great Recession in 2009 and again during the COVID-19 pandemic. As of 2023, the unemployment rate for young adults between the ages of 18 and 30 was 5.7 percent, its lowest rate since 2000.

Unemployment rates alone show only a partial picture of labor market activity, especially among young adults. Recent research shows that young Americans are increasingly exiting the labor market. We show this

FIGURE A.4
Unemployment Rate for Americans Ages 18–30



SOURCE: Authors' calculations using CPS data from IPUMS.
NOTE: Survey data are weighted using person-level weight that is available for questions that were not part of the basic monthly survey questions asked every month in the CPS, such as those on the ASEC (ASECWT).

using the CPS data to tabulate two other metrics: the employment-to-population (ETP) rate, which measures the share of individuals employed, regardless of whether they are in the labor market or not, and the LFP rate, which measures the share of working-age individuals that are either employed or searching for work. We plot these two rates from 2000 to 2023 in Figure A.5.

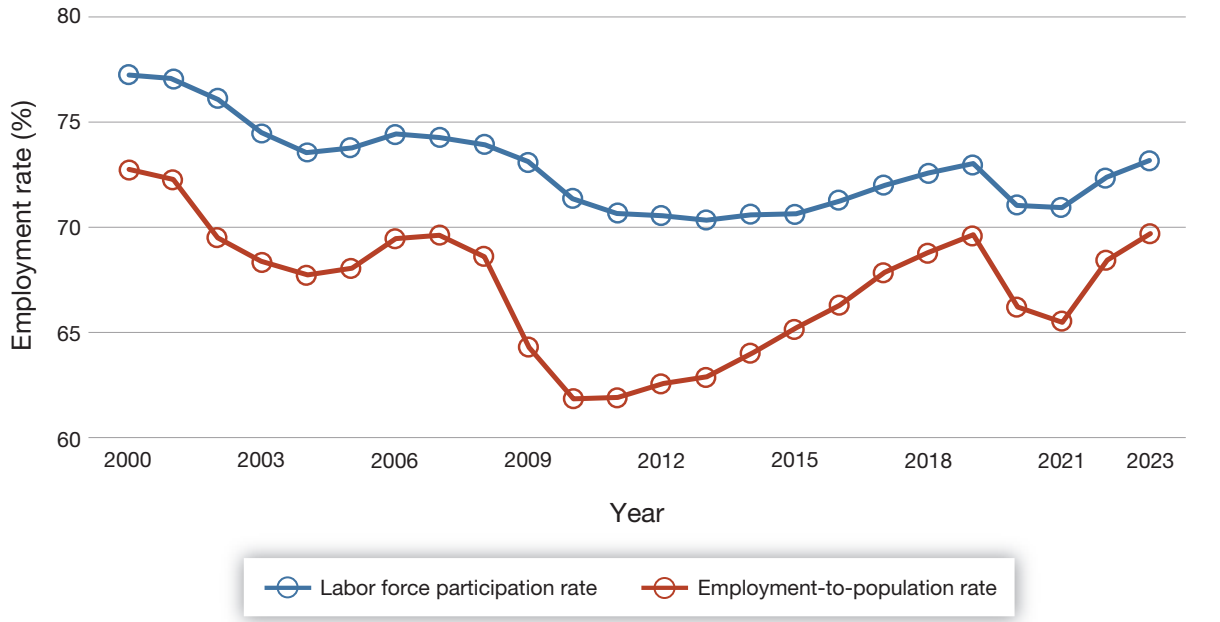
We find that 2023 unemployment rates are lower than 2000 levels (6.75 percent, compared with 5.73 percent, as shown in Figure A.4), suggesting that more young adults are in engaged in labor force activity. The ETP and LFP rates are also lower, indicating that fewer young people are working or looking for work. While both the ETP and LFP rates dipped during the COVID-19 pandemic beginning in 2020, their levels have recovered in recent years relative to 2019. As of 2023, 73.19 percent of Americans between the ages of 18 and 30 were in the labor force and 69.70 percent were employed.

Figure A.6 shows how the LFP rates for young adults have changed related to 2000 by gender and by disaggregated age group, ages 18–24 and 25–30. We disaggregate age groups because those who are ages 18–24 could be out of the labor force because they are pursuing college. We find that men between the ages of 18 and 24 have witnessed the largest decline in LFP since 2000, over 8 percentage points lower than its level in 2000. Women between the ages of 25 and 30 have nearly the same LFP rate in 2023 as they did in 2000. The older male and the younger female groups have roughly similar declines in their respective LFP rates, 3.76 percentage points for older males and 4.61 percentage points for younger females.

Considerable research has been conducted to explain the declines in LFP and employment rates that have occurred not just among young adults but the entire workforce. We review that literature below when we consider changes in underlying supply and demand factors that have occurred in recent years. But first, we note one additional broad change in labor market activity that has occurred in recent years: the rise of part-time, temporary, and gig work and the overall reduction in hours worked among working young adults (Lee, Park, and Shin, 2023).

FIGURE A.5

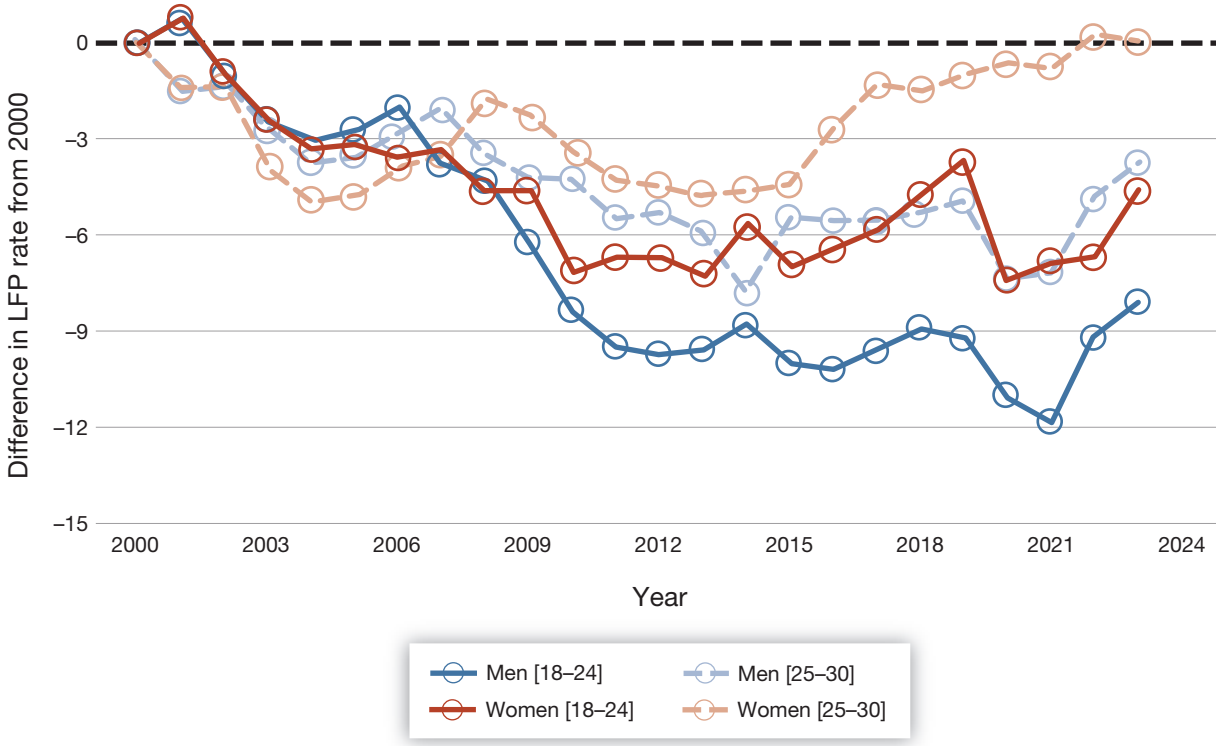
U.S. Labor Force Participation and Employment-to-Population Rates for Americans Ages 18–30



SOURCE: Authors' calculations using CPS data from IPUMS.

FIGURE A.6

Change in Labor Force Participation Rates Relative to 2000 by Sex and Age Group

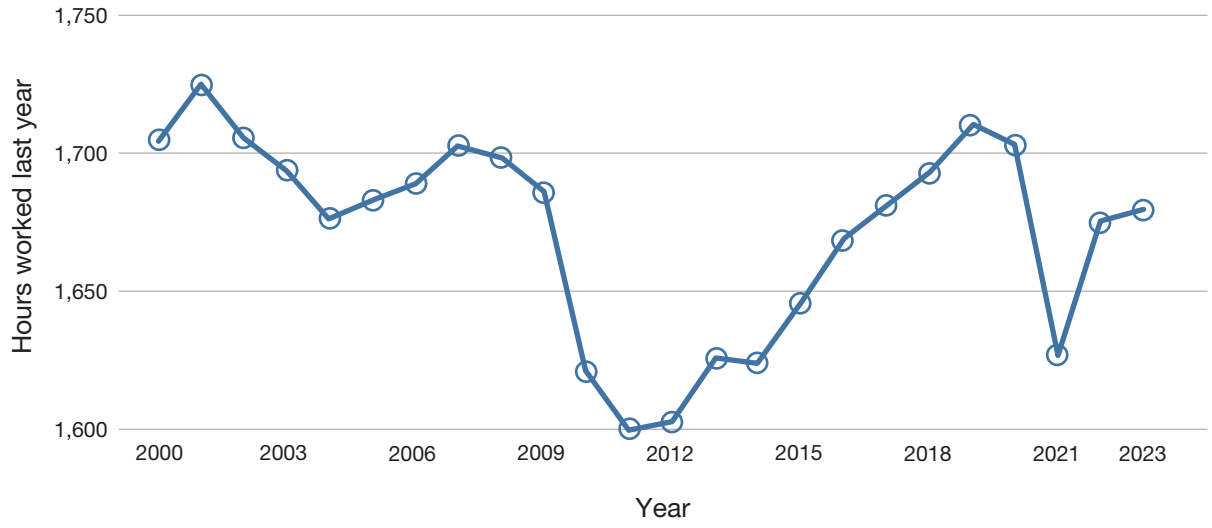


SOURCE: Authors' calculations using CPS data from IPUMS.

NOTE: This figure plots the changes in the LFP rate for the young and old cohorts by sex from their values in 2000. The differences are in percentage points, not a percentage change.

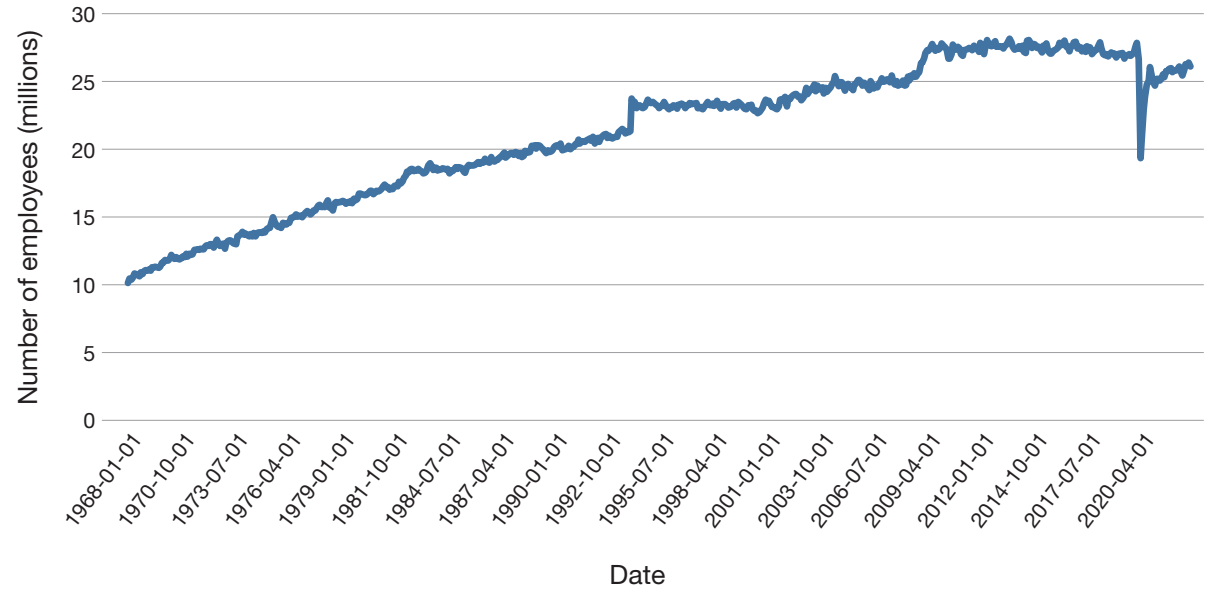
We use CPS data to compute the annual total hours worked by individuals ages 18–30, as shown in Figure A.7. The figure shows a sharp decline in total hours in 2021, followed by a comparably sharp recovery between 2021 and 2023. Some of this decline is attributable to a rise in part-time employment, which includes individuals who work between one and 34 hours per week. Figure A.8 shows that, since the late 1960s, part-time work steadily grew until around 2010, when part-time employment peaked. A sharp drop occurred at the onset of the COVID-19 pandemic, with part-time employment increasing since then but still below

FIGURE A.7
Average Total Annual Hours Worked Among Those Employed, Ages 18–30



SOURCE: Authors' calculations using CPS data from IPUMS.

FIGURE A.8
Number in the United States Who Are Employed, Usually Working Part-Time (in Millions)



SOURCE: Adapted from Federal Reserve Bank of St. Louis, undated d, using BLS data.

peak levels. In November 2022, 26.1 million individuals reported usually working part-time (Federal Reserve Bank of St. Louis, undated d).

Part-time workers who would prefer full-time work but can only find part-time employment are known as involuntary part-time workers. A BLS study estimated that about one-fourth of part-time workers were involuntary part-time workers, with the remaining three-fourths employed voluntarily part-time. The study also found that in 2016, over 65 percent of voluntary part-time workers were women. The two most common reasons for working part-time voluntarily were school attendance and family/personal obligations, where family/personal obligations excluded child care (Dunn, 2018).

Table A.2 shows that the portion of employed young men in different education groups who were working part-time generally increased between 2000 and 2022; the exception were young men ages 18–24 with some college, where the portion decreased by 11.2 percent. For the other groups, the portion with part-time employment increased from as low as 20.5 percent among 18- to 24-year-old men with high school degrees up to 100.9 percent among 25- to 30-year-old men with high school degrees. Although part-time work among 18- to 24-year-old men with some college decreased over time, this demographic group has the largest share reporting part-time employment compared with the other groups, with more than one in five men usually working part-time in 2022. These increases in the number of young men working part-time suggest that part-time opportunities for this demographic group have increased over the past couple of decades. Golden (2016) finds that the rise in part-time employment before the COVID-19 pandemic was largely driven by people who were involuntarily working part-time and would have preferred to work full-time. Since the COVID-19 pandemic the rise in part-time workers has been attributed to voluntary part-time workers (i.e., those who choose to work part-time; Weber, 2023).

Two other types of nontraditional employment have also increased in recent years: temporary work and gig work. Temporary workers provide employers with labor flexibility, allowing them to grow or shrink their workforces when needed (Luo, Mann, and Holden, 2021). Figure A.9 shows that the number of temporary workers has grown steadily since the early 1990s, with large temporary drops during recessionary periods. As of November 2022 there were about 3.1 million temporary workers in the United States (Federal Reserve Bank of St. Louis, undated b). The largest occupational groups employing temporary workers were transportation and material moving (25 percent), production (16 percent), and office and administrative support (15 percent; BLS, 2024b).

The gig economy can be generally thought of as the online platforms that match consumers with providers (Jackson, 2019), such as Instacart and Uber. Figure A.10 shows rapid growth in the number of individuals

TABLE A.2
Percentage of Men Who Usually Work Part-Time

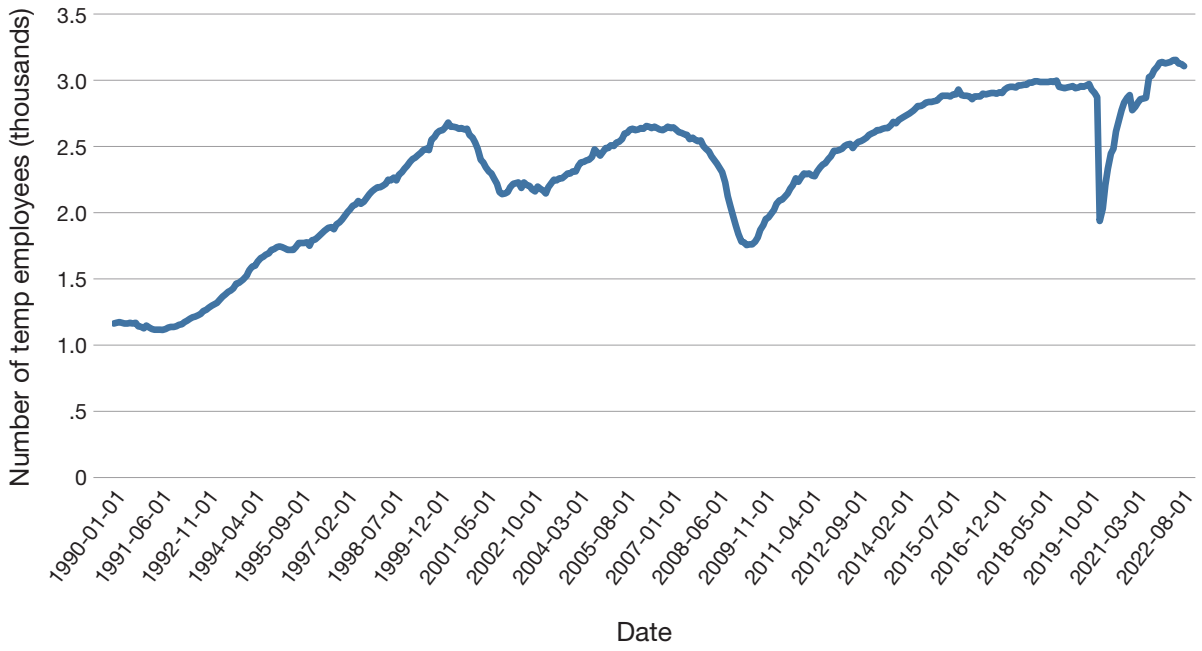
Age Group	Educational Attainment	2000	2022	Percentage Change Between 2000 and 2022
18–24	High school graduate	11.8%	14.2%	20.5%
18–24	Some college	25.1%	22.3%	–11.2%
18–24	College graduate or higher	9.3%	13.6%	46.7%
25–30	High school graduate	3.2%	6.4%	100.9%
25–30	Some college	6.5%	8.3%	26.8%
25–30	College graduate or higher	4.0%	5.5%	36.7%

SOURCE: Authors' calculations using data from the CPS.

NOTE: Part-time work is defined as reporting one to 34 hours usually worked per week at all jobs. Statistics are weighted by ASECWT.

FIGURE A.9

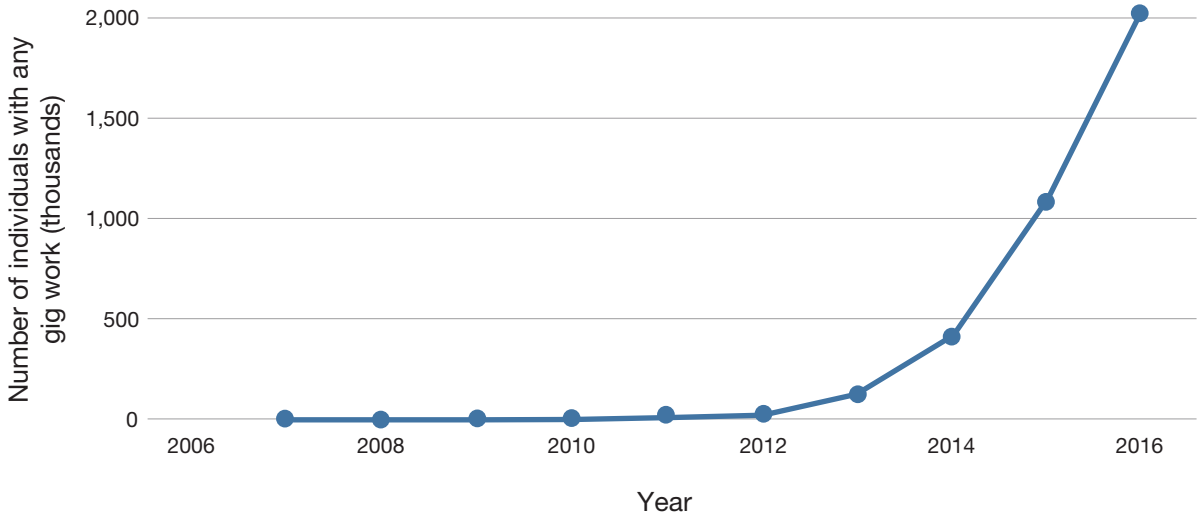
Temporary Help Service Employment (in Thousands)



SOURCE: Adapted from Federal Reserve Bank of St. Louis, undated b, using BLS data.

FIGURE A.10

Number of Gig Workers, 2007–2016



SOURCE: Reproduced from Jackson, 2019, p. 30; used with permission.

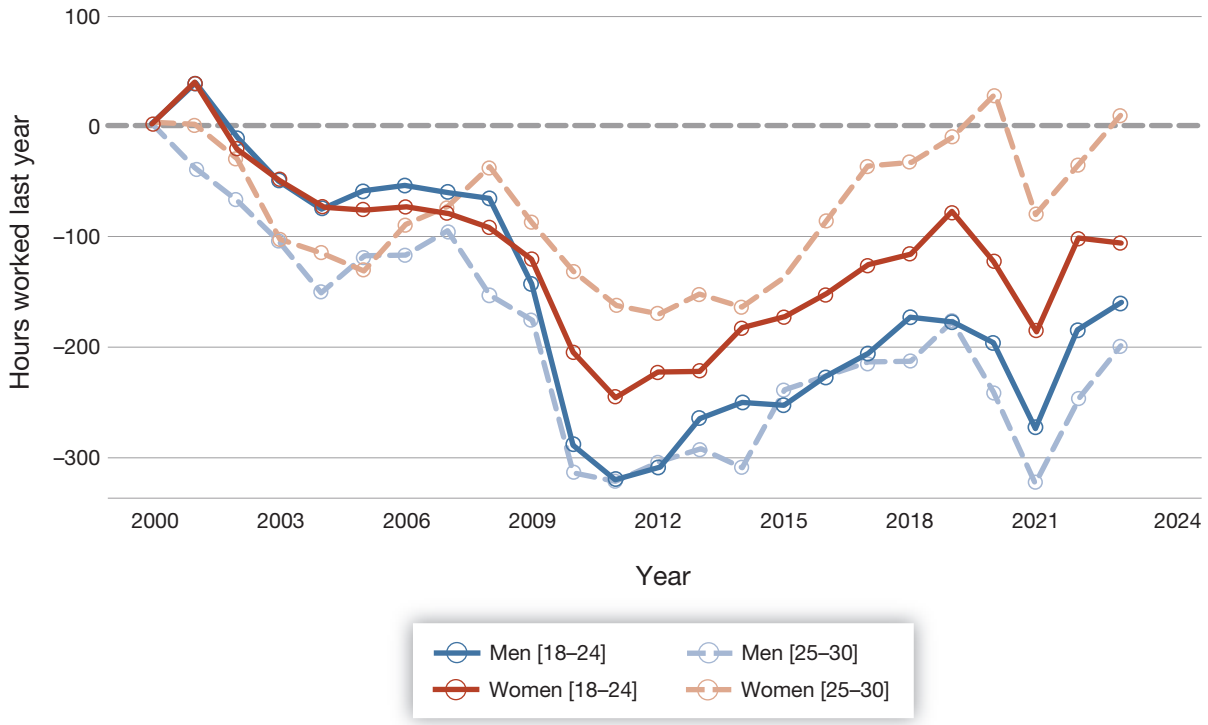
NOTE: This figure presents the yearly number of individuals with any gig work as identified using the universe of federal individual income tax returns for the United States. This includes counts of the universe of individuals who received Form 1099-MISC or Form 1099-K from a gig platform identified in Section 2.2 of Jackson, 2019, or filed Schedule C, denoting income from one of these platforms.

who earn income through gig work, with the number of gig workers rising from nearly zero in 2012 to over 2 million in 2016 (Jackson, 2019). While more recent data on the estimated number of gig workers are, to our knowledge, not readily available, a Pew Research Center study that surveyed U.S. adults in August 2021 estimated that 30 percent of Americans ages 18–29 have ever earned money through an online gig platform (Anderson et al., 2021), demonstrating that a sizable share of the population engages in this form of nontraditional work. Furthermore, a large segment of the 18–29 age group was recent or current gig workers. Specifically, 9 percent of Americans ages 18–29 were current gig workers, and 13 percent worked in the gig economy in the past 12 months (Anderson et al., 2021).

Echoing the trends in unemployment and LFP, Figure A.11 uses CPS data to show declines in the annual hours worked by sex and age category. Among the four groups, only women between the ages of 25 and 30 have hours worked that are comparable with their levels in the base year, 2000. These women reported working roughly 1,450 hours on average in both 2000 and 2023. However, the other cohorts reported substantial declines, which were highest among men, and particularly the older male cohort. Men ages 25–30 worked an average of 1,961 hours in 2000, but just 1,761 in 2023, a decrease of 200 hours, or approximately 10 percent.

FIGURE A.11

Annual Hours Worked, by Sex and Age Group



SOURCE: Authors' calculations using March ASEC data from IPUMS.

NOTE: Hours worked last year is calculated from the respondent's usual hours worked per week in the last year and the number of weeks worked in the last year. The calculation includes all individuals, regardless of their employment status. Statistics are weighted by ASECWT.

Factors Explaining Employment Trends

Past studies have investigated why LFP has fallen over time (e.g., Abraham and Kearney, 2020; Perez-Arce and Prados, 2021). Abraham and Kearney (2020) reviewed the available literature and provide estimates of the extent to which different supply and demand factors contribute to the fall in the ETP ratio between 1999 and 2018.[1] Table A.3 lists factors where the authors were able to estimate the reduction in ETP ratio and whether they relate to the demand or supply of labor. In descending order of importance, the factors that most explain the decline in the employment ratio are import competition from China, technology, and the adoption of industrial robots; higher minimum wages; increased receipt of disability benefits; and increased rates of incarceration. Factors that were not found to have an impact based on the existing empirical evidence include food stamp program expansions; public health insurance program expansions; more generous earned income tax credit; increased difficulties due to lack of family leave; and expanded immigration. Abraham and Kearney (2020) also describe factors where the empirical evidence has not reached a consensus on their impact on employment, including increased difficulties due to lack of child care; changes in leisure options; changes in social norms; increased use of opioids; rise in occupational licensing; and increases in institutional frictions and/or mismatch. In this section we provide additional background on these and other demand and supply of labor factors.

TABLE A.3
Degree to Which Labor Demand and Supply Factors Explain the Estimated Reduction in Employment-to-Population Ratio Between 1999 and 2018

Factor	Demand or Supply	Estimated Reduction in ETP Ratio Between 1999 and 2018
Import competition from China	Demand	0.92
Technology and the adoption of industrial robots	Demand	0.43
Higher minimum wages	Demand	0.10
Increased receipt of disability benefits	Supply	0.17
Increased rates of incarceration	Supply	0.12
Food stamp program expansions	Supply	0
Public health insurance program expansions	Supply	0
More generous earned income tax credit	Supply	0
Increased difficulties due to lack of family leave	Supply	0
Expanded immigration	Supply	0

SOURCE: Authors' calculations, based on data from Abraham and Kearney, 2020.

NOTE: The estimated reduction in ETP ratio between 1999 and 2018 was 3.8; the table shows the amount of that reduction attributed to different factors.

[1] While Abraham and Kearney (2020) focus on factors that have an evidence base with data with which to produce estimates, Perez-Arce and Prados (2021) include topics that affect certain demographic groups that may be less relevant for military populations, such as changes to the Social Security retirement program.

Labor Demand Factors

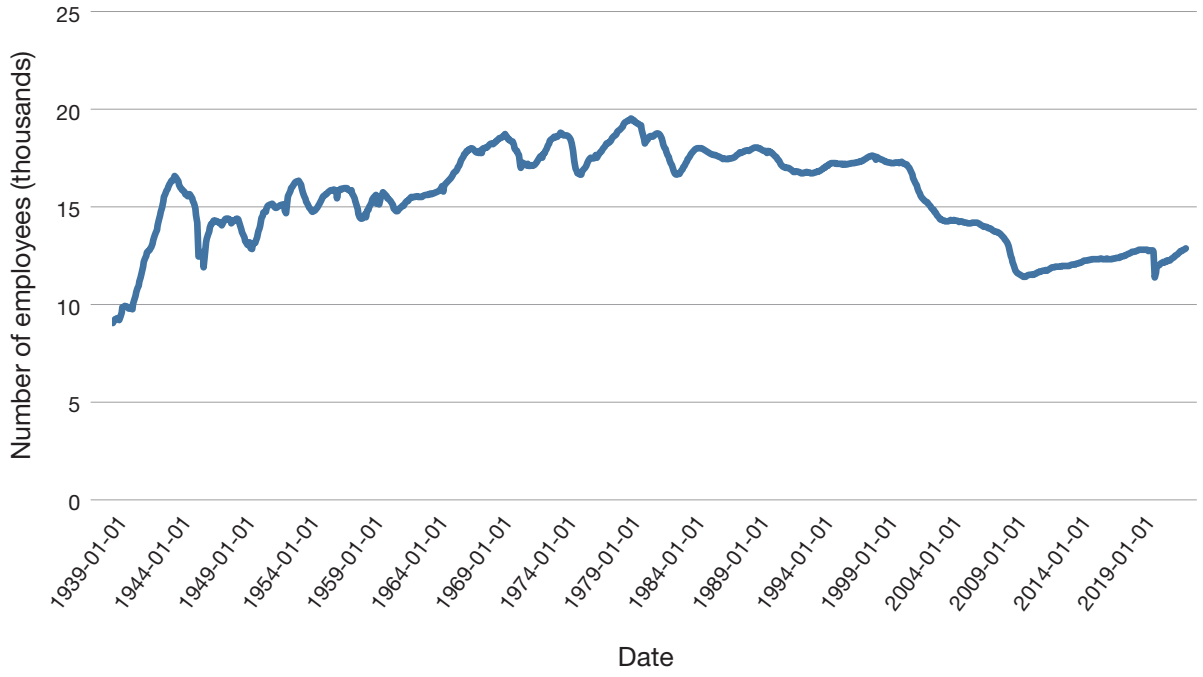
Studies find that Chinese imports have adversely affected labor demand—specifically, the employment of workers in manufacturing, which typically includes lower-skilled, less educated men (Autor, Dorn, and Hanson, 2013; Autor, Dorn, and Hanson, 2015; Bernard, Jensen, and Schott, 2006). Employment in the manufacturing sector peaked in 1979 and has generally fallen since then, as shown in Figure A.12. For example, Pierce and Schott (2016) find that a change in U.S. trade policy that eliminated potential tariff increases on imports from China was associated with a sharp drop in U.S. manufacturing employment after 2000. Another factor that research has found to adversely affect labor demand and employment is technology and specifically industrial robotics (Acemoglu and Restrepo, 2017).

Abraham and Kearney (2020) estimate that 24 percent of the decline in the employment rate between 1999 and 2018 was attributable to import competition from China, while 11 percent of the decline was attributed to the adoption of robots.

Another changing demand factor is rising minimum wage rates. In theory, increasing the cost of workers will cause firms to reduce their demand for labor. The literature has found mixed results regarding the relationship between rising minimum wage rates and employment, with some papers finding no significant relationship (Allegretto et al., 2013; Allegretto, Dube, and Reich, 2011; Dube, Lester, and Reich, 2010; Dube and Zipperer, 2015) and more recent papers documenting a negative relationship (Clemens and Wither, 2019; Jardim et al., 2022; Powell, 2022). Using the largest estimates of the disemployment effect of minimum wage increases from the literature, Abraham and Kearney (2020) estimate that about 3 percent of the decline in the ETP ratio between 1999 and 2018 is due to rising minimum wage rates.

FIGURE A.12

U.S. Manufacturing Sector Employment (in Thousands)



SOURCE: Adapted from Federal Reserve Bank of St. Louis, undated a, using BLS data.

Labor Supply Factors

The decline in LFP of young men raises questions about how young men are supporting themselves and what they are doing if they are not working. This subsection considers these questions and reviews factors related to the supply of labor including trends in disability, opioid use, and incarceration. We also review available information on whether attitudes toward working have changed among recent cohorts.

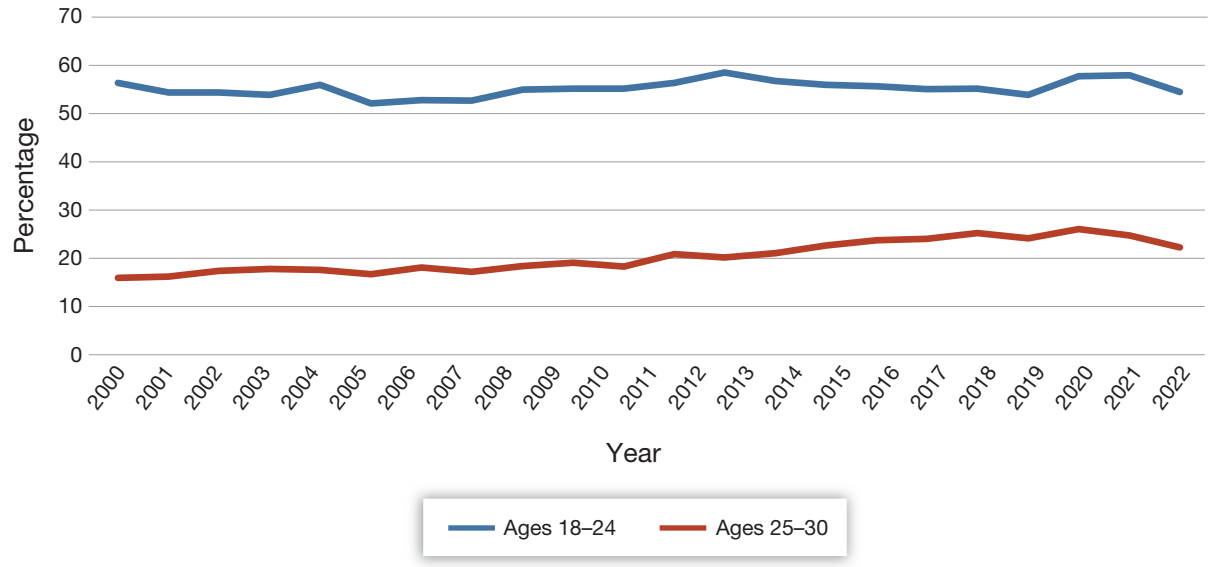
How Are Young Men Supporting Themselves?

We use the CPS data to tabulate the portion of men ages 18–24 and 25–30, respectively, living with their parents, as shown in Figure A.13. Given that children who are living in college dormitories and have never been married are also considered to be living with their parents,[2] it is not surprising that men ages 18–24 have a higher propensity to live with their parents than men ages 25–30. The portion of men ages 18–24 living with parents hovered around 55 percent between 2000 and 2022. In contrast, the portion of men ages 25–30 living with parents increased over time, from 16 percent in 2000 to as high as 26 percent in 2020 before dropping to 22 percent in 2022. Thus, as LFP of young men fell, the likelihood that men ages 25–30 lived with their parents rose.

For young men, an increasing share of household income is earned by other members of the household, as shown in Table A.4. These drops are largest among high school graduates, with the percentage of household income earned by men ages 18–24 falling from 45 percent in 2000 to 39 percent in 2022 and the percentage of household income earned by men ages 25–30 falling from 69 percent in 2000 to 62 percent in 2022.

Table A.4 focuses on household income, but tabulations of sources of individual income among young men show that the share of their income that is from earnings has decreased since 2000. Sources of individual income can be divided into five categories: personal earnings, transfers, investments, educational assistance, and other income. *Personal earnings* include wage earnings, nonfarm business income, and farm income. *Transfers* include Social Security income, welfare and public assistance income, income from unemployment benefits, income from worker's compensation, income from veteran's benefits, income from supplemental

FIGURE A.13
Fraction of Men, Ages 18–24 and 25–30, Living with Parents



SOURCE: Authors' calculations using data from the CPS.
NOTE: Excludes those with less than a high school degree. Observations in calculation are weighted by ASECWT.

[2] See the section "Children" in the definitions for the CPS's technical documentation; U.S. Census Bureau, 2024.

TABLE A.4
Percentage of Household Income Earned by Men

Age Group	Educational Attainment	2000	2022	Difference
18–24	High school graduate	45%	39%	–6%
18–24	Some college	37%	35%	–2%
18–24	College graduate or higher	58%	59%	1%
25–30	High school graduate	69%	62%	–7%
25–30	Some college	69%	66%	–3%
25–30	College graduate or higher	76%	75%	–1%

SOURCE: Authors' calculations using data from the CPS.
NOTE: Statistics are weighted by ASECWT.

security income, and income from disability benefits. *Investments* include interest income, dividend income, and rental income. *Educational assistance* includes Pell Grants or other aid from government sources, nongovernmental scholarships and grants, and financial assistance from employers or friends. *Other income* is defined as all other sources of income, including retirement income, survivor's benefits, income from child support, regular financial assistance from friends or relatives not living in the same household, and income from other unspecified sources.

We find that the share of individual income that is from earnings fell from 86.3 percent to 79.9 percent between 2000 and 2023 among men ages 18–24 and from 93.6 percent to 89.6 percent among men ages 25–30. For men ages 18–24, the reduction in earnings is offset by increases in the remaining income categories. For men ages 25–30, the reduction in earnings is mainly offset by increases in transfers and investments. Thus, young men are relying less on their own earnings and more on other sources of income, including transfers, investments, educational assistance, and income from other household members.

How Are Young Americans Spending Their Time?

We look at two alternatives to work that might explain the decline in hours worked by young people, as shown earlier in Figure A.11. First, we test whether these declines are a product of higher rates of enrollment in postsecondary education and, second, whether time spent working has been replaced by leisure. Using data from the National Center for Education Statistics, we plot the total enrollments for degree-granting postsecondary institutions in Figure A.14, finding that enrollments have fallen since their peak in 2010. Thus, we reject the hypothesis that education accounts for the decline in work for young Americans in recent years.

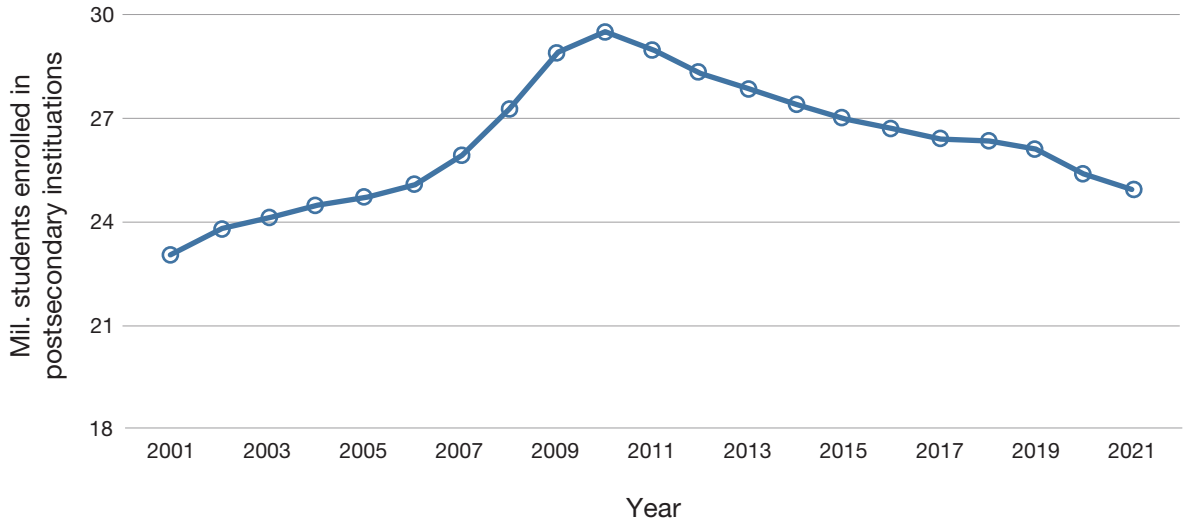
Second, we examine trends in time spent on leisure using the American Time Use Survey, a time diary carried out by the U.S. Census Bureau (BLS, undated). From its native time use activities, we construct a leisure category, which includes:

1. relaxing and thinking
2. tobacco and drug use
3. television and movies (not religious)
4. television and movies (religious)
5. listening to the radio
6. listening to or playing music (not on the radio)
7. playing games
8. computer use for leisure.

Figure A.15 plots the difference in average leisure time for men and women ages 18–24 and ages 25–30 by cohort relative to 2003, the first year that American Time Use Survey data are available. We find that

FIGURE A.14

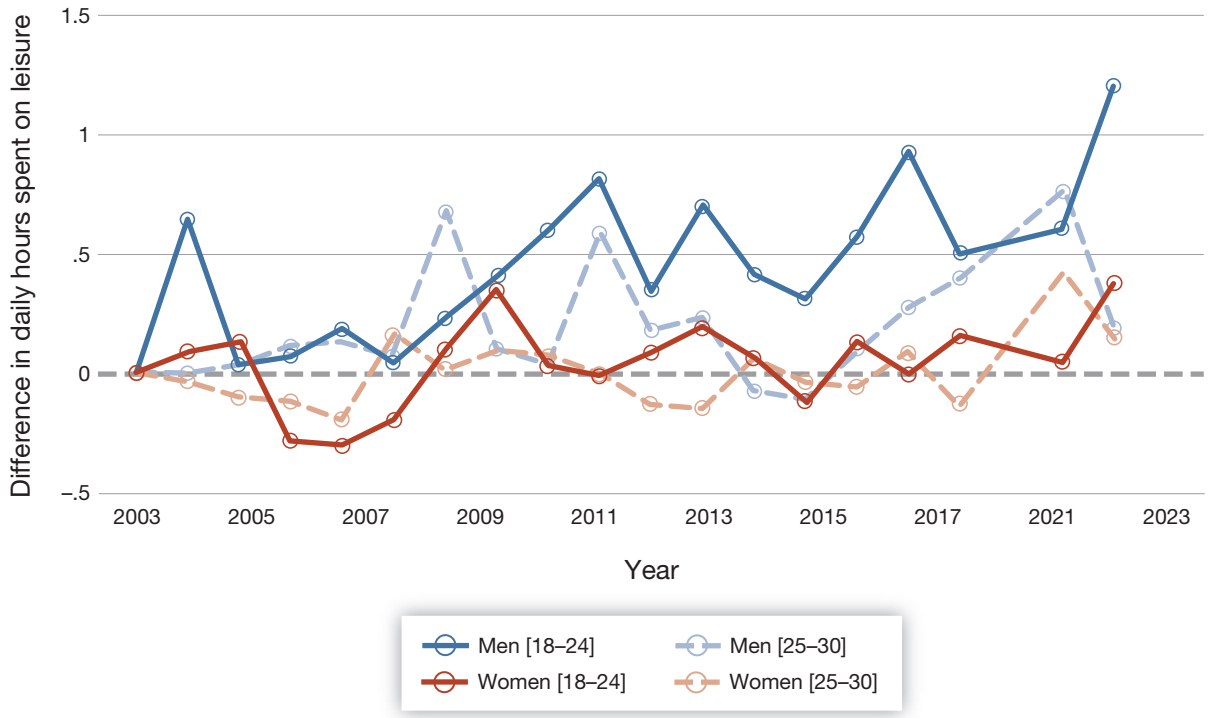
Enrollment in Postsecondary Institutions (in Millions)



SOURCE: National Center for Education Statistics (undated).
NOTE: "Mil" refers to millions.

FIGURE A.15

Difference in Daily Hours Spent on Leisure Relative to 2003 Among Men and Women, Ages 18–24 and 25–30



SOURCE: Authors' calculations using American Time Use Survey data downloaded through IPUMS.
NOTE: Weights (the tufnwgtp data element, a variable in the IPUMS American Time Use Survey file) are used in calculating these statistics to make them representative of the population. Leisure is a combination of time spent on eight different time-use categories: (1) relaxing and thinking, (2) tobacco and drug use, (3) television and movies (not religious), (4) television and movies (religious), (5) listening to the radio, (6) listening to or playing music (not on the radio), (7) playing games, and (8) computer use for leisure. We exclude time diaries that were administered on holidays.

leisure time has increased among all four groups and that increases have been largest among men ages 18–24, a group that devoted 3.36 hours per day to leisure in 2003 but roughly 4.57 hours in the most recent survey. Aguiar et al. (2017) examined the relationship between recreational computer use and the labor supply of young men and show similar results. They argue that innovations in gaming and recreational computer use explain recent increases in leisure and declines in market hours worked among men between the ages of 21 and 30.

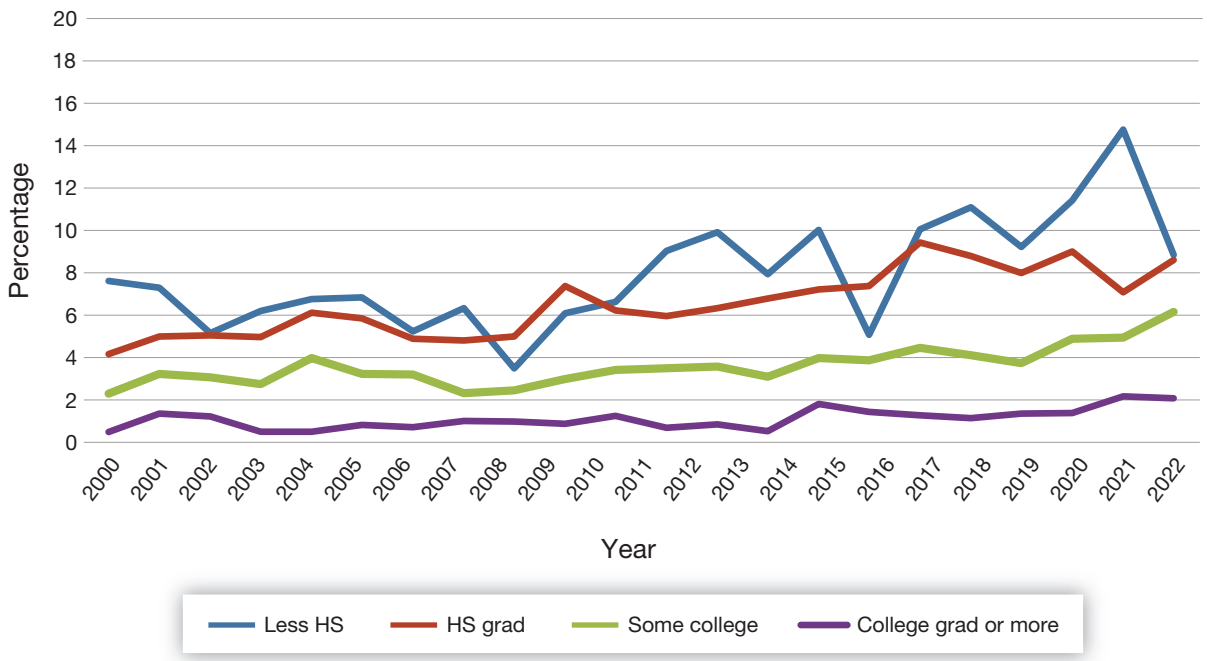
While Figure A.15 shows substantial increases in leisure time among young men, even more striking is the portion of this group spending eight or more hours per day on leisure activities. We find that in 2003, 8.30 percent of men ages 28–24 spent eight or more hours per day on leisure, a figure that rose to 20.56 percent in 2022.

Other Labor Supply Factors

Three labor supply factors that may have adversely affected LFP are rising disability rates, increased drug use (especially opioids), and rising incarcerations. We review these trends next.

We used March ASEC data to compute the portion of young men reporting a disability that limits or prevents work (see Figure A.16). Prior literature has estimated that 5 percent of the decline in the ETP ratio between 1999 and 2018 was attributed to increases in disability benefit receipt (Abraham and Kearney, 2020). We find that the rise in the percentage of young men reporting a work limiting disability is most apparent for men ages 25–30, with the growth being larger among those with some college education or less. Notably, the percentage of men reporting a work disability among those ages 25–30 with less than a high school degree almost doubled, from 7.6 percent in 2000 to 14.8 percent in 2021. However, because the active duty population consists almost exclusively of service members with a high school degree or higher education, large

FIGURE A.16
Fraction Reporting a Disability That Limits or Prevents Work Among Men, Ages 25–30



SOURCE: Authors' calculations using data from the CPS.
NOTE: HS = high school; statistics are weighted by ASECWT.

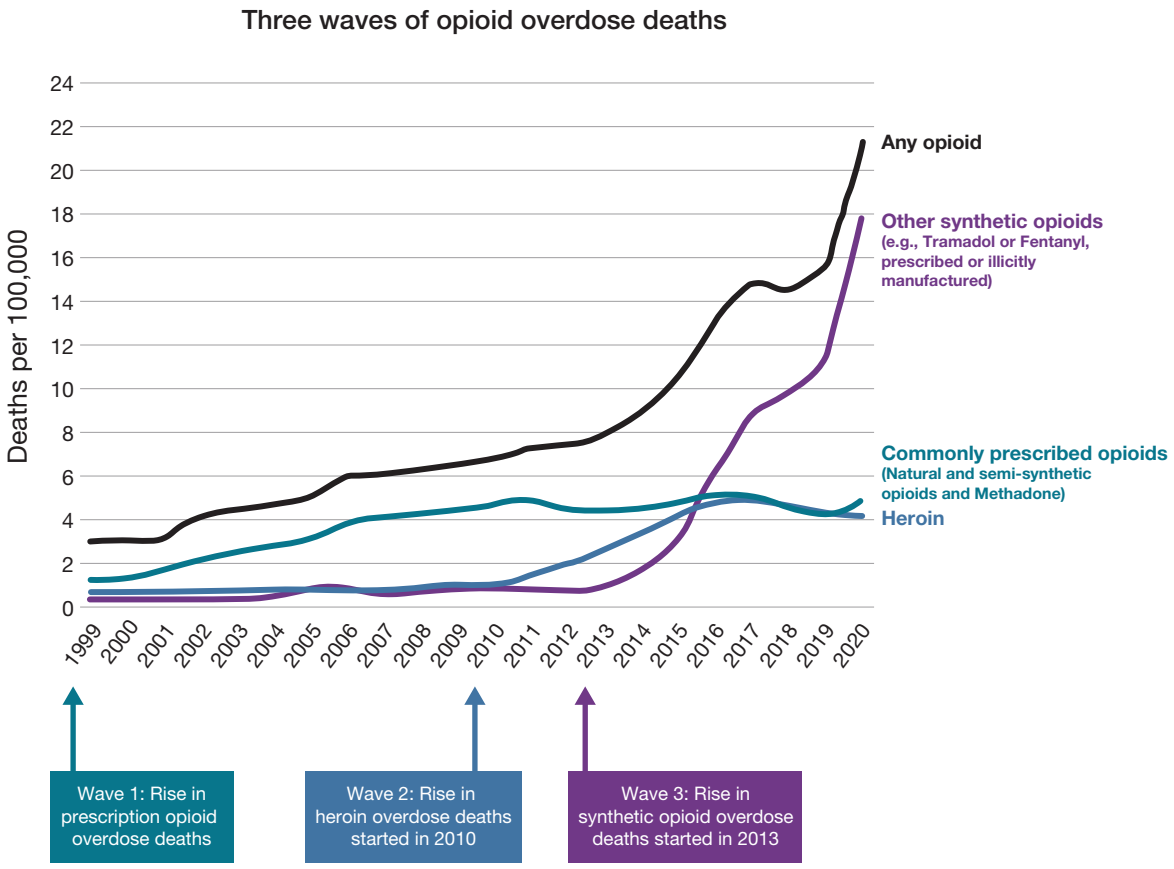
increases in work disability among those without a high school degree are less relevant for the military. The trends show modest increases in the percentage of men ages 18–24 reporting a work disability among those with some college or less, though the rates of disability are quite low (not shown).

As shown in Figure A.17, opioid overdose deaths have increased sharply since 2013, with much of this growth attributed to deaths in synthetic opioids (e.g., fentanyl). The number of overdose deaths increased by almost 30 percent between 2019 and 2022 (Centers for Disease Control and Prevention, 2022). Drug overdose death rates vary across states, with those in the Appalachian region and some states in the Northeast, the Southwest, Florida, and Louisiana being hit the hardest (see Figure A.18). It is unclear whether higher opioid use causes lower LFP or if the reverse is true (Abraham and Kearney, 2020).

Prior literature shows that rising incarceration rates are linked to the decline in employment, with about 3 percent of the decrease in the ETP ratio between 1999 and 2018 being attributed to rising incarceration (Abraham and Kearney, 2020). Figure A.19 shows an increase in the correctional population since 1990, peaking around 2008 and falling since then. In 2021, 93 percent of the imprisoned population were men, with men ages 35–49 having the highest rate of imprisonment for all men (Carson, 2022). Moreover, 1.1 to 1.5 percent of U.S. men ages 25–49 were estimated to be incarcerated in 2021 (Carson, 2022).

FIGURE A.17

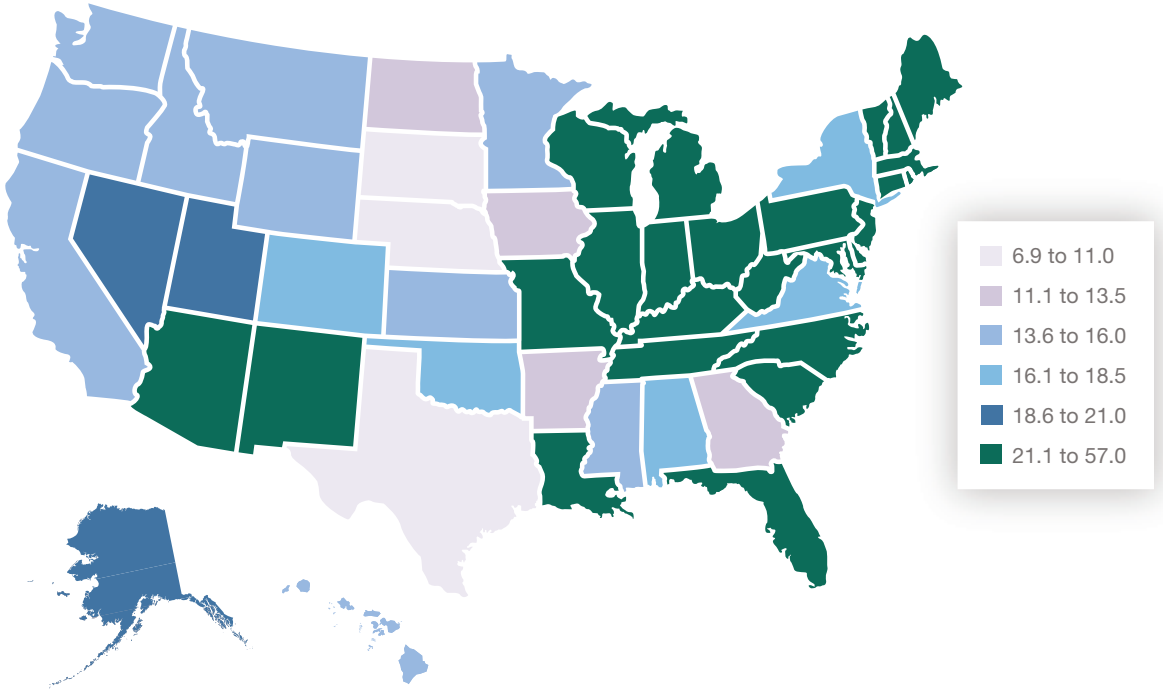
Opioid Overdose Death Trends, 1999–2000



SOURCE: National Vital Statistics System Mortality File. Reproduced from Centers for Disease Control and Prevention, 2022.

FIGURE A.18

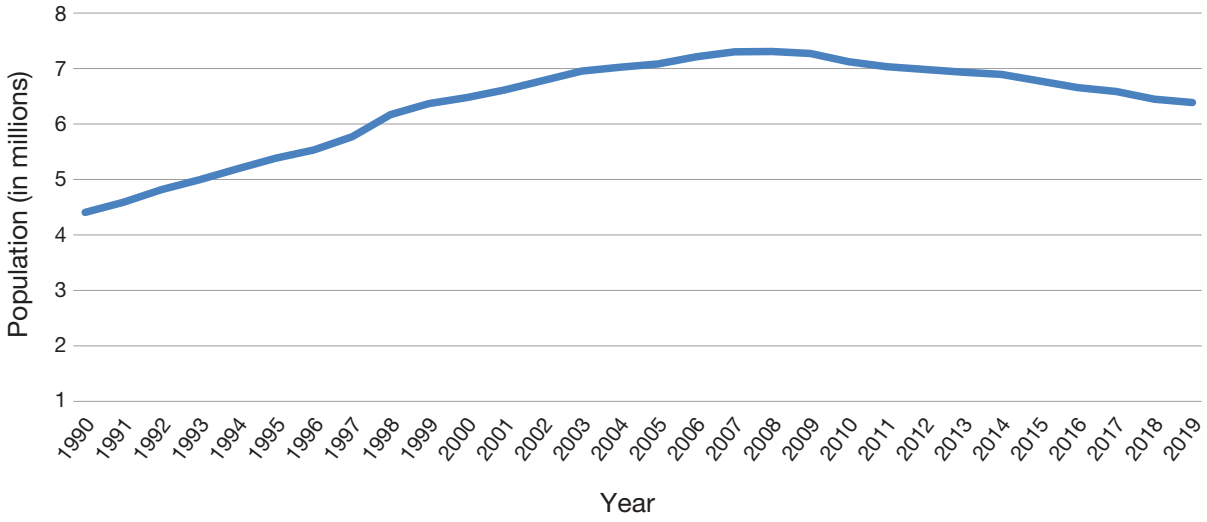
Drug Overdose Death Rates by State per 100,000 Population, 2020



SOURCE: Reproduced from Centers for Disease Control and Prevention, 2021.
NOTE: Rates are per 100,000 population.

FIGURE A.19

Total U.S. Correctional Population, 1990–2019 (in Millions)



SOURCE: Beatty, 2010; Minton, Beatty, and Zeng, 2021.
NOTE: Correctional population includes individuals who are incarcerated, on probation, or on parole.

Attitudes Toward Work

While research has documented differences in attitudes toward work between older generations and younger generations (Twenge, 2010), supporting evidence from the academic literature demonstrating that such differences exist is lacking, owing to the difficulty of empirically estimating such differences. Specifically, the empirical strategies used in existing studies on generational differences are unable to separate differences due to age, time period, and birth cohort (Costanza and Finkelstein, 2015; Zabel et al., 2017). For example, a difference in attitudes between those in their 20s and those in their 50s could be due to differences in age at a point in time, differences in generations (birth cohort), or factors or conditions specific to the time period. A 50-year-old today could have had similar attitudes toward work when they were in their 20s if they faced similar conditions at that age.

Broadly speaking, there is no consistent evidence that younger generations (individuals born after 1982) differ from previous generations in terms of their interest in job stability, wanting to help others, or finding meaning in work (Twenge, 2010; Twenge et al., 2010). Some studies document an increasing desire to have a work-life balance, a higher valuation of leisure, and a greater emphasis on salary among younger generations compared with older generations (Twenge, 2010; Twenge et al., 2010; Wey Smola and Sutton, 2002). A Pew Research Study on millennials found that when asked about what makes their generation unique, "work ethic" was among the top five answers for Gen Xers, baby boomers, and the Silent Generation, but not a top response among millennials (Pew Research Center, 2010). Moreover, the percentage of workers who say their job gives them a sense of identity has fallen over time, from 57 percent in 1989 to 51 percent in 2016 (Pew Research Center, 2016).

It remains to be seen whether generational differences in attitudes toward work will emerge in a post-COVID-19 era. Most of the discussion on work in a post-COVID-19 era focuses on telework flexibilities. A Pew Research Center survey shows that a top reason for working from home in 2022 was due to personal preference (Parker, Horowitz, and Minkin, 2022). In addition, 64 percent of teleworking employees say working from home has made it easier to balance work and personal life (Parker, Horowitz, and Minkin, 2022). To the extent that younger generations value a better work-life balance, increasing telework flexibilities could make their view of work more favorable than before the pandemic.

COVID-19 Pandemic Changes in Civilian Employment

The COVID-19 pandemic changed the landscape for employers and employees, and it remains to be seen if these changes will remain permanent. First, the pandemic affected employment in certain sectors. For example, as was shown in Figure A.12, manufacturing employment increased due to increased demand for durable goods. Whether the growth in manufacturing employment will be sustained or will taper off remains to be seen. The pandemic also shifted employment away from service industries and toward online retail, which may adversely affect less educated male LFP (Groshen and Holzer, 2021). Piacentini et al. (2022) hypothesize that growth in automation and reduced demand for high-contact jobs and services during the pandemic may drive less educated male LFP down further.

The pandemic also emphasized the need for essential occupations, which includes occupations in public health and safety, manufacturing and selling essential products, and other infrastructure support (Torpey, 2020). Many of these occupations do not require high levels of education, as shown in Table A.5. For example, the top three essential occupations in terms of projected annual openings and 2019 employment required no formal education for employment: cashiers; hand laborers and freight, stock, and material movers; and janitors and cleaners. Most of the essential occupations shown in the table required a high school degree or equivalent.

TABLE A.5
Projected Annual Job Openings for Essential Occupations, 2019–2029

Occupation	Openings, Projected 2019–2029 Annual Average	Employment, 2019	Typical Entry Requirements	Median Annual Wage, 2019
Cashiers	562,300	3,622,500	No formal educational credential	$23,650
Hand laborers and freight, stock, and material movers	380,600	2,986,000	No formal educational credential	$29,510
Janitors and cleaners, except maids and housekeeping cleaners	305,600	2,374,200	No formal educational credential	$27,430
Stockers and order fillers	254,900	2,135,800	High school diploma or equivalent	$27,380
Registered nurses	175,900	3,096,700	Bachelor's degree	$73,300
Delivery truck drivers and driver/sales workers	163,100	1,506,000	High school diploma or equivalent	$32,020
Assemblers and fabricators	156,300	1,883,700	High school diploma or equivalent	$33,710
General maintenance and repair workers	139,400	1,516,400	High school diploma or equivalent	$39,080
Agricultural workers	132,400	902,900	Varies	$26,030
Engineers	117,500	1,810,100	Bachelor's degree	$94,500
Food processing workers	98,100	832,800	Varies	$29,320
Electricians	82,200	739,200	High school diploma or equivalent	$56,180
Farmers, ranchers, and other agricultural managers	80,900	952,300	High school diploma or equivalent and five years or more work experience in a related occupation	$71,160
Computer support specialists	68,400	882,300	Varies	$54,760
Financial managers	59,600	697,900	Bachelor's degree and five years or more work experience in a related occupation	$129,890
Police and sheriff patrol officers	51,000	688,400	High school diploma or equivalent	$63,150

SOURCE: Torpey, 2020.

Second, work amenities offered by employers changed in response to the pandemic. According to the BLS 2021 Business Response Survey, the availability of telework options and flexible work hours increased (BLS, undated a). Specifically, 34.5 percent of establishments increased telework for some or all employees and, among these establishments, 60.2 percent expected to make increased telework permanent when the pandemic was over, suggesting that just over 20 percent of all establishments, or one in five establishments, would make increased telework permanent. The survey also found that 24.6 percent of establishments started to offer flexible or staggered work hours to employees because of the pandemic. Researchers have similarly concluded that there will be a permanent increase in teleworking (Barrero, Bloom, and Davis, 2021; Davis, Ghent, and Gregory, 2021; Piacentini et al., 2022). Barrero, Bloom, and Davis (2021) estimate that 20 percent of full workdays will be supplied from home after the pandemic, compared with just 5 percent before the pandemic.

APPENDIX B

Supplementary Material for Chapter 2

This appendix provides detailed descriptions of the methodology used in Chapter 2 to compare military pay with that of comparable civilians. It begins by describing how the detailed RMC percentiles are created, starting with raw data used in the analysis. This exercise is then repeated for the additional data sources used in the weighted average (i.e., summary) RMC percentiles, a metric that requires information on the education distribution of the military and personnel counts by YOS. The differences between the two approaches are emphasized. There are two sources of military education data that may be used as inputs in the calculation of the weighted average RMC percentile, the DMDC's active duty pay files and SOFS, and we find that the educational distribution in 2021 differs between data sources. We rely on self-reported education in SOFS-A when we compute RMC percentiles for 2021 and more recent years. Because SOFS-A data are not available back to the 1990s, we also use the DMDC active duty master file, which comprises administrative rather than self-reported data, to estimate the educational distribution for these earlier years. The two data sources have pros and cons, as we discuss. We find that the choice of data source leads to nontrivial impacts on the summary RMC percentiles' calculations and compare the two DMDC-weighted and SOFS-weighted RMC percentiles over time. Finally, we review the literature on CPS nonresponse, which has biased income estimates in recent years, and discuss its potential implications for our analysis.

Detailed Regular Military Compensation Calculation

The detailed RMC percentile methodology yields an RMC percentile for each year of service along the military career (i.e., one to 30 YOS), permitting a close examination of the suitability of military pay in a given calendar year. The methodology compares military personnel and their compensation (i.e., RMC) to the earnings of comparable civilians. What constitutes *comparable civilians* changes depending on the stage of persons' careers. Because the comparison is made with a static education category, no information on military personnel's educational outcomes is required.

We use the March ASEC as the source of civilian pay data. It is an individual-level data file that includes information on respondents' weekly income, age, education, and hours worked. We use this information to identify comparable civilians in the comparison between military and civilian pay. We limit the data to include full-time and full-year workers—that is, we remove any respondents who did not work more than 36 hours a week on average and at least 36 weeks in the previous year. While the March ASEC has data on respondent's age and education, there is no YOS variable, which the Greenbook uses to categorize military pay. Instead we derive a civilian YOS estimate based on the age of a respondent and their education. The formula to determine YOS depends on education: for high school graduates, their YOS are equal to their age at the time of the survey less 18; for those with some college or an associate's degree, the YOS variable is their age less 20; for those with a bachelor's degree, YOS starts at age 22 and, for those with a master's degree or higher education, age 24. The survey asks for respondents' weekly income in the

preceding year. Thus, although the 2022 CPS data are the most recent available, we only have estimates of civilians' earnings up to 2021. All earnings, for both civilians and military personnel, are converted to 2021 dollars.

The CPS includes weights that make it representative of the U.S. population as a whole. To ensure that the comparison between military and civilian pay is sound, we augment these weights so that they reflect the gender composition of the military rather than the civilian population. We acquire information on the gender composition of the military from *PopRep* and edit the CPS's stock survey weights, giving male CPS respondents higher weights to reflect their overrepresentation in the military (e.g., enlisted members were 83 percent male and officers were 80 percent male, according to the latest *PopRep* data) (DoD, OUSD [P&R], 2019).

After this data cleaning and reweighting, we then import the RMC data from Greenbook's Table B4, convert annual pay to weekly, and deflate to 2021 dollars. Then for each year of service (from zero through 30), we estimate where RMC falls relative to the distribution of comparable civilian pay. The final step in the detailed RMC calculation is that all of the plotted values (i.e., the civilian wage percentiles, RMC, and the RMC percentiles) are all smoothed through quadratic regressions. This serves two purposes: first, it makes the figures that plot the detailed RMC smoother and thus easier to view; second, it fills in the "missing" YOS values as the Greenbook provides its data at YOS intervals of one, two, three, four, six, eight, ten, and so on. The regressions interpolate those "missing" values.

Summary RMC Calculation

The calculation of the weighted average RMC percentiles involves three inputs, which are listed in order of their presentation in Tables 2.3 and 2.4:

1. the predicted education distribution by YOS
2. the RMC percentiles for each education category and YOS
3. the personnel count by YOS.

This subsection describes each component and its construction.

To create the first component, the predicted education distribution, we begin with the enlisted and officer education data shown in Tables 2.1 and 2.2, respectively. Each input into the weighted RMC percentile must be at the YOS level, yet the education distribution data we have is at the pay grade level. To convert the pay grade level data to the YOS level, we use the joint distribution of personnel by YOS and pay grade from the Greenbook's Table A6 to estimate the percentage of personnel for each year of service and then derive the predicted education distribution by fitting a series of polynomial curves to each education category, effectively smoothing the distribution and constraining the sum of education fractions for each year of service to one.

We calculate RMC percentiles for each of the education categories by YOS using a similar methodology to that described above. As in that analysis, military pay data comes from the Greenbook and civilian pay from the CPS. However, rather than smoothing the RMC percentiles, we instead directly calculate the percentiles for each education category. Because the Greenbook lists YOS data at irregular intervals (i.e., one, two, three, four, six, eight, etc.), we assign a "missing" YOS interval (i.e., five, seven, nine, etc.) to the RMC of its preceding YOS neighbor. We then compare military pay, as measured by RMC, to that of civilians from each educational category (i.e., high school, some college, etc.) to generate the RMC percen-

tiles. These two inputs, the predicted education distribution and RMC percentiles, are used to calculate a weighted average RMC percentile for each year of service (see the "Weighted Average" column in Tables 2.3. and 2.4).

Finally, to create a single weighted RMC percentile for enlisted members and officers, we average the YOS-level RMC percentiles using the personnel counts (see "Enlisted Count" in Table 2.4 and "Officer Count" in Table 2.4) as weights. The personnel counts come from the DMDC's active duty pay files. Although there are pay files for each month, we use only the September pay files for our counts to measure the services' end strength. We derive each service member's YOS based on the pay file's current year and the year that the service member first entered into the pay file database. We then calculate the total number of personnel by YOS using the September pay file, removing any individuals with missing YOS data and duplicate observations to ensure that individuals are not double-counted.

Military Education Data

In Chapter 2 we use two different data sources to estimate the military education distribution, an input in the calculation of weighted average RMC percentiles (i.e., summary RMC percentiles). As noted above, we use SOFS-A for more recent percentile tabulations but the active duty pay administrative date for the educational distribution for the early years, though, for consistency, we also use the DMDC's active duty pay files for more recent years.

Tables 2.4 and 2.5 show the weighted average RMC percentiles in 2021, and both use SOFS as their source for military education data. However, Figures 2.6 and 2.7 used instead the DMDC active duty pay files as their source for military education distribution. We make this change because DMDC data are available as far back as 1994, while the earliest SOFS data available are from 2002. The additional data allow us to see how military pay has compared with civilian since the inception of the 70th percentile benchmark.

Comparing the results from Table 2.4 and Figure 2.6 shows that there are substantial differences in the weighted average RMC percentile calculating when using the two different data sources: with SOFS-A data, the summary RMC percentile for enlisted members with fewer than 20 YOS is 82.7, while, when weighted using the DMDC's education distribution, the summary RMC is 87.5 for that same group. Table B.1 compares the two YOS-level education distributions for enlisted service members, showing that DMDC data consistently reveal lower education outcomes than reported in SOFS-A.

Table B.2 shows the distribution of educational attainment of officers at each year of service based on SOFS-A data (self-reported) and DMDC data (administrative reports). The self-reported data generally shows a higher level of educational attainment than the administrative data.

To understand how these different education distributions affect the weighted average (i.e., summary) RMC percentiles, we plot the two series in Figures B.1 and B.2. The former, which plots the enlisted RMC percentiles, shows that the SOFS-A education distribution consistently leads to RMC percentiles that are roughly 2 to 5 percentiles lower than those estimated using DMDC data. This is driven by the fact that the higher reported education outcomes from SOFS-A, which means that RMC is increasingly compared with higher-earning civilian cohorts (e.g., greater weights to "Some College" versus "High School").

The differences between the two education data sources, and their effects on the weighted RMC percentiles calculations, are more muted among officers. In Figure B.2, we see that the SOFS-A–weighted RMC percentiles track the DMDC-weighted estimates closely, never differing by more than 3 percentile points.

TABLE B.1

Enlisted Education Distribution Comparison, SOFS-A and DMDC

	SOFS-A Predicted Education Distribution by YOS					DMDC Education Distribution by YOS				
YOS	High School	Some College	Associate's Degree	Bachelor's Degree	Master's Degree or Higher	High School	Some College	Associate's Degree	Bachelor's Degree	Master's Degree or Higher
1	0.60	0.32	0.04	0.04	0.00	0.92	0.01	0.02	0.05	0.00
2	0.49	0.37	0.08	0.06	0.00	0.92	0.01	0.02	0.04	0.00
3	0.41	0.40	0.11	0.08	0.01	0.91	0.01	0.03	0.05	0.00
4	0.35	0.41	0.13	0.09	0.01	0.88	0.02	0.05	0.05	0.00
5	0.31	0.42	0.15	0.10	0.02	0.83	0.02	0.08	0.06	0.00
6	0.28	0.43	0.17	0.11	0.02	0.80	0.03	0.10	0.07	0.01
7	0.25	0.42	0.19	0.12	0.02	0.75	0.04	0.12	0.08	0.01
8	0.23	0.42	0.21	0.13	0.02	0.71	0.05	0.15	0.08	0.01
9	0.21	0.41	0.22	0.13	0.02	0.66	0.05	0.18	0.10	0.01
10	0.19	0.40	0.24	0.14	0.02	0.62	0.05	0.20	0.12	0.01
11	0.18	0.40	0.25	0.15	0.02	0.59	0.06	0.21	0.13	0.02
12	0.17	0.39	0.26	0.16	0.03	0.56	0.06	0.23	0.13	0.02
13	0.15	0.38	0.27	0.17	0.03	0.54	0.07	0.25	0.13	0.02
14	0.14	0.37	0.28	0.18	0.04	0.52	0.07	0.25	0.14	0.03
15	0.13	0.36	0.28	0.18	0.04	0.49	0.07	0.26	0.15	0.03
16	0.12	0.35	0.29	0.19	0.05	0.49	0.08	0.25	0.15	0.03
17	0.12	0.34	0.29	0.20	0.06	0.45	0.08	0.26	0.17	0.04
18	0.11	0.33	0.28	0.21	0.07	0.41	0.08	0.28	0.18	0.05
19	0.10	0.32	0.28	0.22	0.08	0.40	0.08	0.27	0.19	0.06
20	0.10	0.30	0.27	0.24	0.09	0.41	0.08	0.25	0.20	0.06
21	0.10	0.29	0.26	0.25	0.10	0.38	0.08	0.25	0.21	0.08

Table B.1—Continued

YOS	SOFS-A Predicted Education Distribution by YOS					DMDC Education Distribution by YOS				
	High School	Some College	Associate's Degree	Bachelor's Degree	Master's Degree or Higher	High School	Some College	Associate's Degree	Bachelor's Degree	Master's Degree or Higher
22	0.09	0.28	0.25	0.26	0.12	0.37	0.08	0.23	0.23	0.08
23	0.09	0.27	0.23	0.27	0.13	0.35	0.08	0.22	0.25	0.10
24	0.09	0.26	0.22	0.28	0.15	0.33	0.08	0.21	0.25	0.12
25	0.09	0.25	0.20	0.30	0.16	0.34	0.08	0.17	0.27	0.14
26	0.09	0.24	0.19	0.31	0.18	0.32	0.06	0.19	0.29	0.15
27	0.09	0.23	0.18	0.32	0.19	0.32	0.07	0.15	0.30	0.16
28	0.08	0.22	0.17	0.32	0.20	0.34	0.06	0.15	0.28	0.16
29	0.08	0.22	0.16	0.32	0.21	0.30	0.06	0.15	0.30	0.19
30	0.08	0.22	0.17	0.31	0.22	0.29	0.07	0.14	0.30	0.20

SOURCE: Authors' calculations using DMDC and SOFS-A data.

TABLE B.2

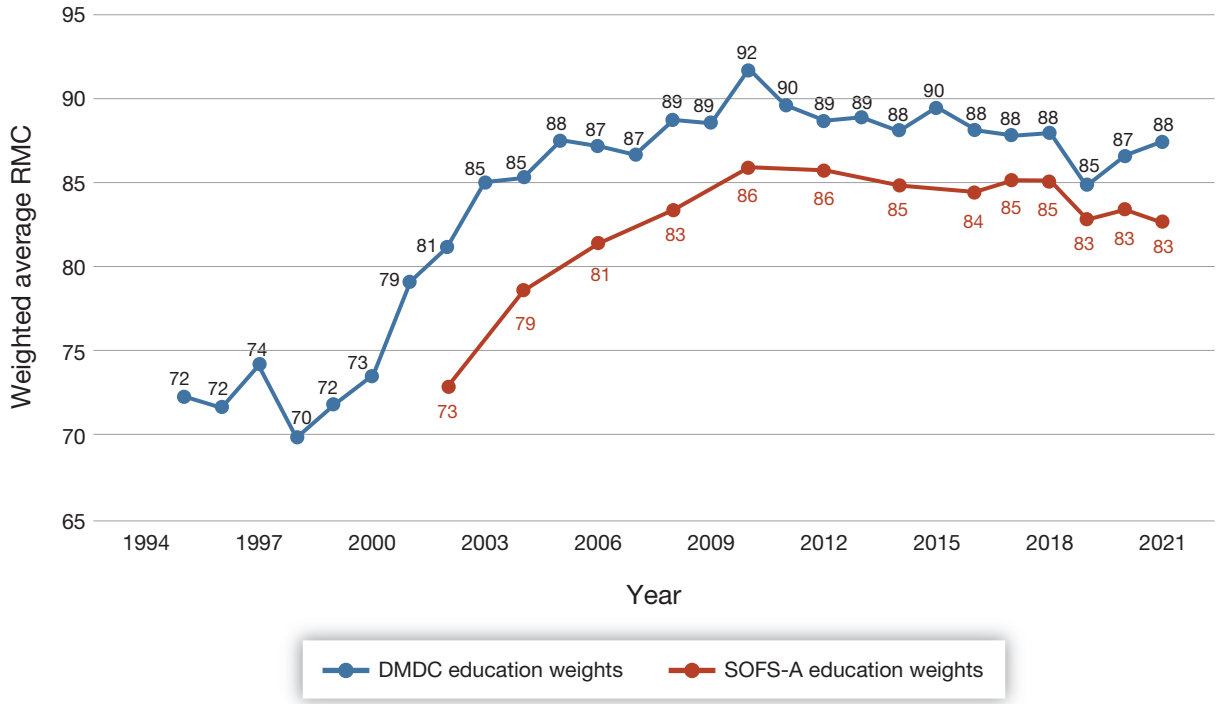
Officer Education Distributions Comparison, SOFS-A and DMDC

	SOFS-A Predicted Education Distribution		DMDC Education Distribution	
YOS	Bachelor's Degree	Master's Degree or Higher	Bachelor's Degree	Master's Degree or Higher
1	0.90	0.10	0.88	0.12
2	0.82	0.18	0.86	0.14
3	0.75	0.25	0.85	0.15
4	0.69	0.31	0.84	0.16
5	0.62	0.38	0.81	0.19
6	0.57	0.43	0.78	0.22
7	0.51	0.49	0.73	0.27
8	0.46	0.54	0.70	0.30
9	0.42	0.58	0.67	0.33
10	0.37	0.63	0.61	0.39
11	0.33	0.67	0.54	0.46
12	0.30	0.70	0.47	0.53
13	0.27	0.73	0.38	0.62
14	0.24	0.76	0.32	0.68
15	0.21	0.79	0.29	0.71
16	0.19	0.81	0.27	0.73
17	0.17	0.83	0.25	0.75
18	0.15	0.85	0.25	0.75
19	0.13	0.87	0.25	0.75
20	0.12	0.88	0.25	0.75
21	0.11	0.89	0.22	0.78
22	0.10	0.90	0.21	0.79
23	0.09	0.91	0.20	0.80
24	0.09	0.91	0.19	0.81
25	0.08	0.92	0.20	0.80
26	0.08	0.92	0.17	0.83
27	0.08	0.92	0.16	0.84
28	0.08	0.92	0.16	0.84
29	0.08	0.92	0.16	0.84
30	0.08	0.92	0.16	0.84

SOURCE: Authors' calculations using DMDC and SOFS-A data.

FIGURE B.1

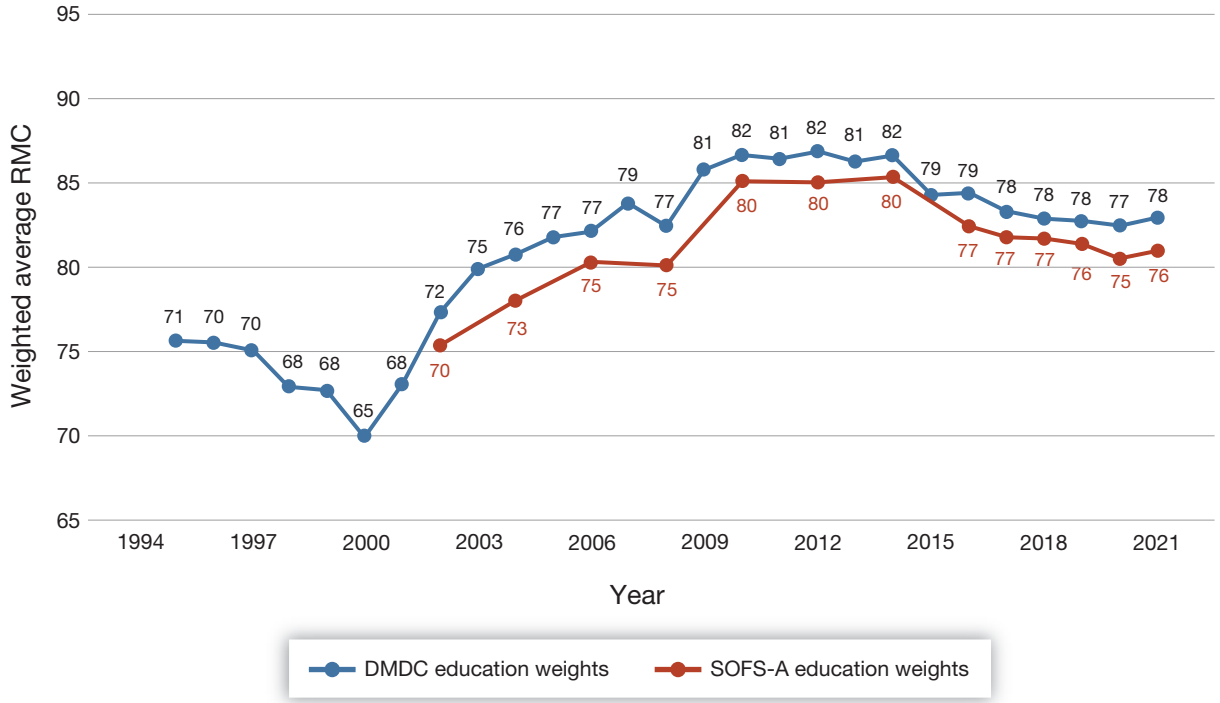
Enlisted Regular Military Compensation Percentiles Comparison, SOFS-A and DMDC



SOURCE: Authors' calculations using the DMDC's active duty pay files, the Greenbook, the March ASEC, *PopRep*, and SOFS-A.

FIGURE B.2

Officer Regular Military Compensation Percentiles Comparison, SOFS-A and DMDC



SOURCE: Authors' calculations using the DMDC's active duty pay files, the Greenbook, the March ASEC, *PopRep*, and SOFS-A.

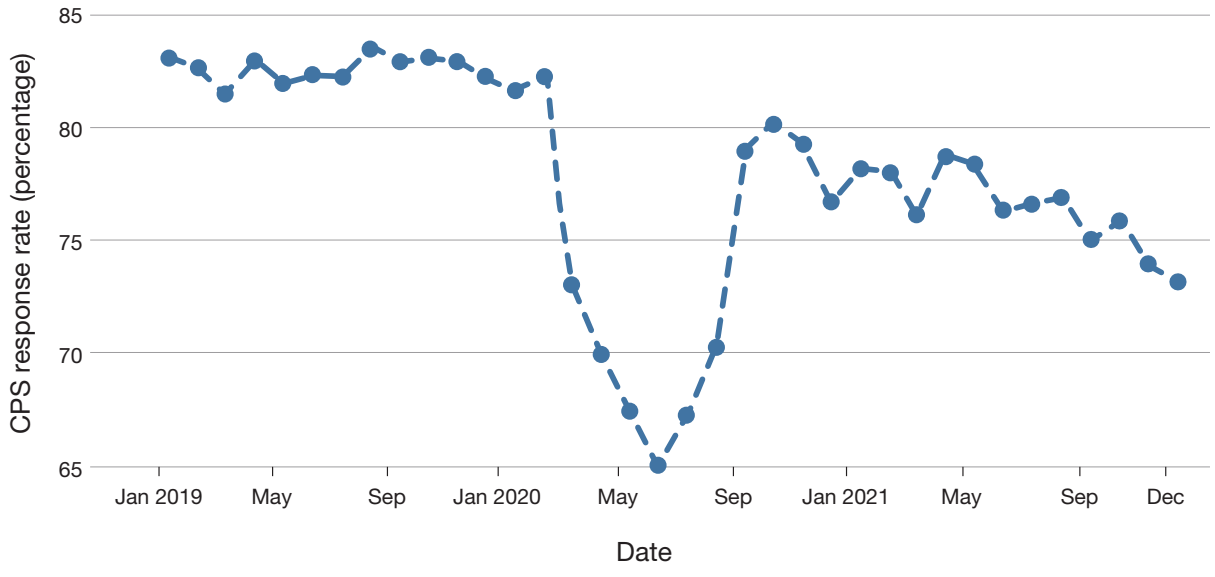
COVID-19 Survey Nonresponse

The COVID-19 pandemic drastically reduced response rates for many surveys. The CPS, our primary source of civilian data throughout this analysis, was no exception. Figure B.3 plots the CPS response rates from January 2019 through December 2021. It shows that response rate for 2020's March ASEC, fell far below typical levels (i.e., around 65 percent at its lowest in June 2020).

Survey nonresponse does not necessarily bias estimates, but it is only harmless if the nonresponse is random (or, at least, not correlated with the measures of interest). Rothbaum and Bee (2021) show, however, that COVID-19 survey nonresponse was nonrandom and, in fact, strongly correlated with income, and much more so than survey response before the onset of COVID-19. The authors compare the CPS data to administrative data from return filings (e.g., W-2s and 1099 forms), the latter being much more costly to avoid and thus a better measure of "true" parameters (e.g., income, employment, education, etc.). They find that CPS respondents tended to be wealthier and better educated than their nonrespondent counterparts, which biased 2019 income estimates. Using the original survey weights, real median household was $68,700 in 2019—a 6.8 percent increase from the previous year. However, after adjusting for nonresponse bias, the authors estimate the 2019 median household income to be only $66,790, 2.8 percent lower than the estimate using survey weights.

This nonresponse bias affects our estimates of civilian income and, consequently, the RMC percentiles. Given that those with lower incomes and less education (e.g., high school graduates) were less likely to respond to the CPS in early 2020, it is unsurprising that our estimated weekly income for young (i.e., first year of service) high school graduates climbs rapidly in 2019, before falling to roughly pre-COVID-19 levels in 2020. Those that might normally make up the lower-end of the 18- and 19-year-old high school income distribution simply did not appear in the data. This artificial growth in the 90th percentile of civilian pay reflects only the bias induced by nonresponse, not the inadequacy of RMC, which, as seen in Figure B.4, changes little

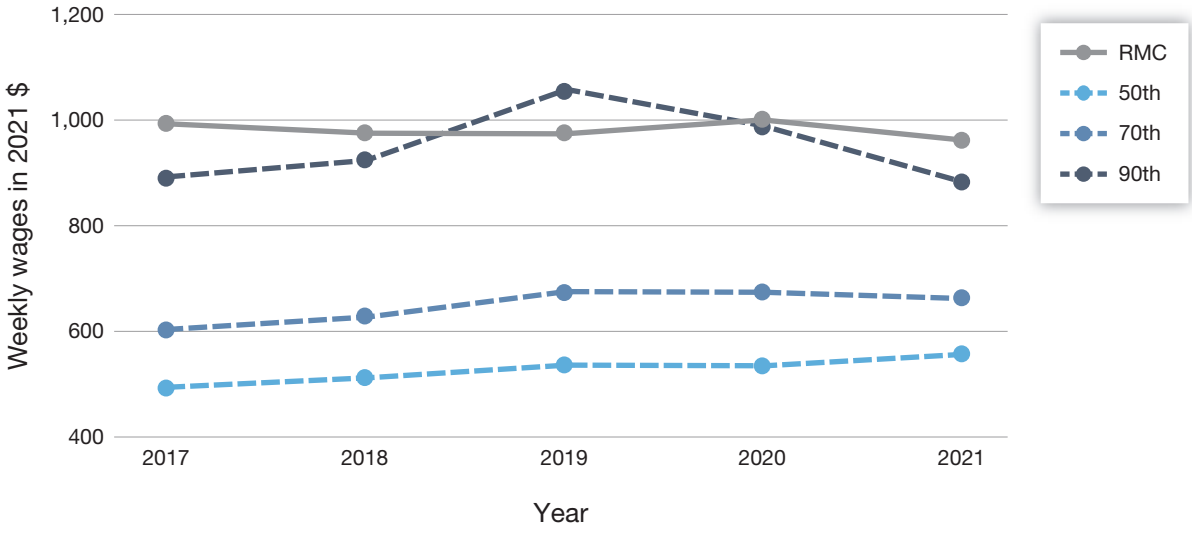
FIGURE B.3
Current Population Survey Nonresponse, 2019–2021



SOURCE: BLS, undated c.

FIGURE B.4

Regular Military Compensation and Comparable Civilian Pay: Enlisted, with One Year of Service



SOURCE: Authors' calculations using the Greenbook, the March ASEC, *PopRep*, and SOFS.

during this time frame. The figure shows that RMC percentile falls below 90 for early career enlisted members but quickly recovers by 2020—all driven by sporadic estimates of civilian weekly wages. It is important to note that the median and 70th percentiles of civilian pay do not witness such sporadic change during this time period.

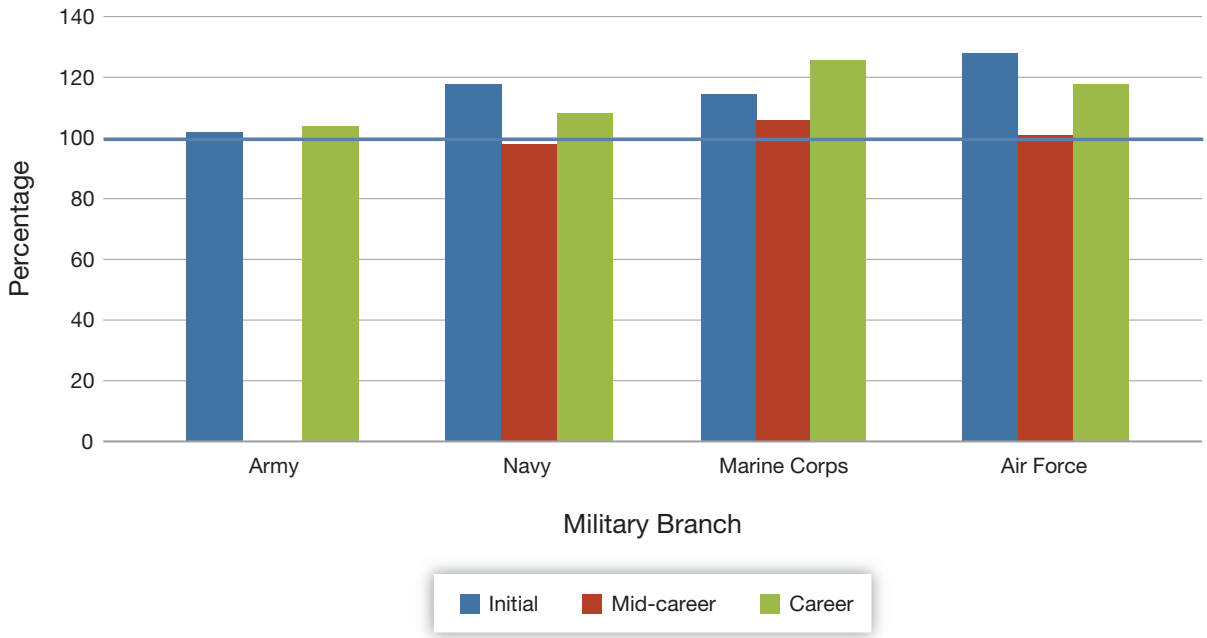
APPENDIX C

Supplementary Tables and Figures for Chapter 3

This appendix provides supplementary tables and figures for Chapter 3.

FIGURE C.1

Percentage of Fiscal Year 2023 Active Duty Retention Missions Attained



SOURCE: DoD, OUSD(P&R), 2023.

TABLE C.1

Months of Service at Promotion, Averaged over 2013–2018

Pay Grade at Promotion	Army	Navy	Marine Corps	Department of the Air Force	Coast Guard	All
E-2	3	3	1	2	3	3
E-3	6	8	5	6	7	6
E-4	8	19	17	26	11	18
E-5	32	40	32	51	58	40

SOURCE: DMDC tabulations provided to authors.

TABLE C.2

Annual and Cumulative Increase in the ECI, Basic Pay, and the CPI-U

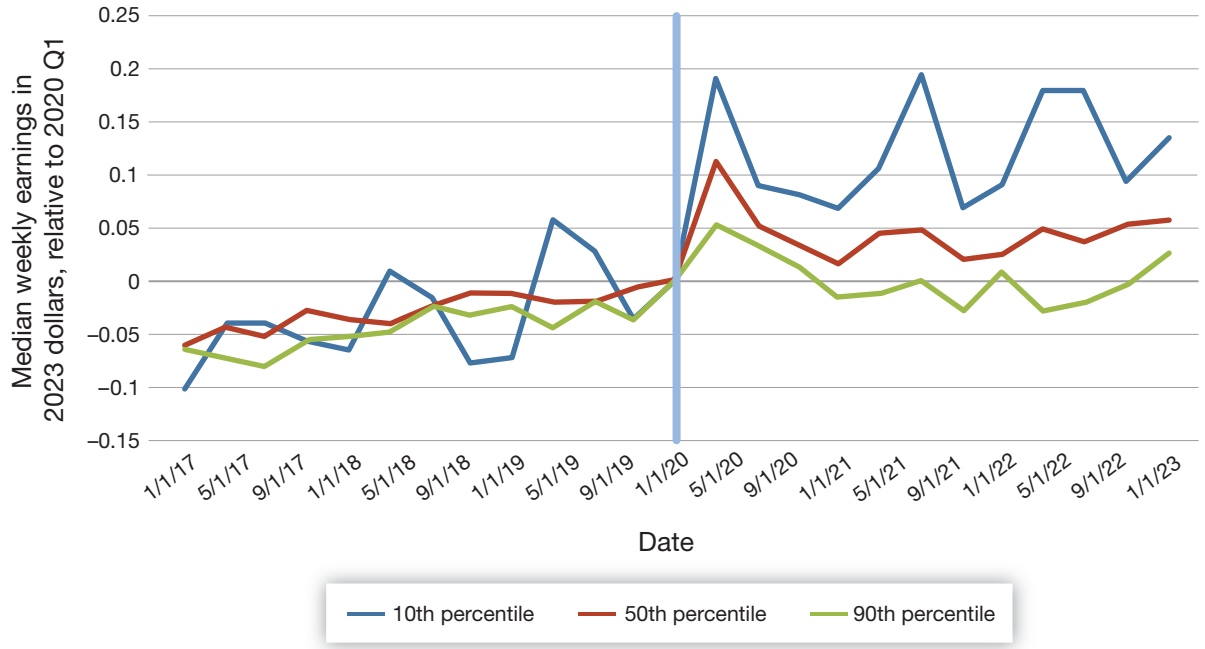
	Annual Increase			Cumulative Increase Since 2000			Cumulative Increase Since 2020		
Year	ECI	Basic Pay	CPI–U	ECI	Basic Pay	CPI–U	ECI	Basic Pay	CPI–U
2000	0.034	0.048	0.028						
2001	0.032	0.037[a]	0.037	0.032	0.037	0.037			
2002	0.041	0.050[a]	0.012	0.074	0.089	0.050			
2003	0.036	0.041[a]	0.028	0.113	0.133	0.079			
2004	0.032	0.037[a]	0.020	0.149	0.175	0.100			
2005	0.03	0.035	0.028	0.183	0.217	0.132			
2006	0.026	0.031	0.040	0.214	0.254	0.177			
2007	0.022	0.022[a]	0.021	0.241	0.282	0.202			
2008	0.030	0.035	0.043	0.278	0.327	0.253			
2009	0.034	0.039	–0.001	0.321	0.378	0.252			
2010	0.029	0.034	0.026	0.359	0.425	0.285			
2011	0.014	0.014	0.017	0.379	0.445	0.306			
2012	0.016	0.016	0.030	0.401	0.468	0.346			
2013	0.017	0.017	0.017	0.424	0.493	0.368			
2014	0.018	0.010	0.016	0.450	0.508	0.390			
2015	0.018	0.010	–0.002	0.476	0.523	0.387			
2016	0.023	0.013	0.012	0.510	0.543	0.404			
2017	0.021	0.021	0.022	0.542	0.576	0.434			
2018	0.024	0.024	0.016	0.579	0.613	0.456			
2019	0.026	0.026	0.018	0.620	0.655	0.482			
2020	0.031	0.031	0.025	0.670	0.707	0.519			
2021	0.030	0.030	0.014	0.720	0.758	0.541	0.030	0.030	0.014
2022	0.027	0.027	0.076	0.767	0.805	0.658	0.058	0.058	0.091
2023	0.046	0.046	0.063	0.848	0.888	0.763	0.106	0.106	0.160
2024	0.052	0.052	0.028	0.944	0.987	0.812	0.164	0.164	0.193

SOURCES: Congressional Research Service, 2018; Congressional Research Service, 2023a; DoD; Federal Reserve Bank of Saint Louis, undated c.

[a] Pay table reform also occurred that gave additional targeted pay raises to certain parts of the pay table. The increase in the table does not incorporate the changes due to pay table reform.

FIGURE C.2

Indexed Median Real Weekly Earnings of Civilian Full-Time Workers in Each Year Relative to 2020, Ages 18–30, by Percentile of Civilian Earnings



SOURCE: Authors' computations using CPS data from the BLS.
NOTE: The figure shows index earnings for full-year, full-time employees.

TABLE C.3

Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-6	$2,980.50	$3,279.90	$3,424.80	$3,565.50	$3,711.90	$4,042.20	$4,170.90
E-5	$2,730.30	$2,914.20	$3,055.20	$3,199.20	$3,423.90	$3,658.50	$3,851.70
E-4	$2,503.50	$2,631.60	$2,774.10	$2,914.80	$3,039.30	$3,039.30	$3,039.30
E-3	$2,259.90	$2,402.10	$2,547.60	$2,547.60	$2,547.60	$2,547.60	$2,547.60
E-2	$2,149.20	$2,149.20	$2,149.20	$2,149.20	$2,149.20	$2,149.20	$2,149.20
E-1	$1,917.60	$1,917.60	$ 1,917.60	$1,917.60	$1,917.60	$1,917.60	$1,917.60
E-1 fewer than four months	$1,773.00						

SOURCE: DoD, OUSD(P&R), 2023.

TABLE C.4

Proposal of Representative Mike Garcia: Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-4	$2,600.00	$2,600.00	$2,774.10	$2,914.80	$3,039.30	$3,039.30	$3,039.30
E-3	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00
E-2	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00
E-1	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00	$2,600.00
E-1 fewer than four months	$2,600.00						

SOURCE: H.R. 2591, 2023.

NOTE: Basic pay for E-5 and E-6 under this proposal is the same as the baseline 2023 pay table shown in Table A.3.

TABLE C.5

House Appropriations Committee Proposal: Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-6	$3,210.00	$3,279.90	$3,424.80	$3,565.50	$3,711.90	$4,042.20	$4,170.90
E-5	$3,100.30	$3,150.20	$3,200.20	$3,250.20	$3,423.90	$3,658.20	$3,851.70
E-4	$3,010.50	$3,060.60	$3,100.10	$3,150.80	$3,210.30	$3,260.30	$3,260.30
E-3	$2,900.90	$2,900.90	$,2950.60	$3,000.60	$3,050.60	$3,050.60	$3,050.60
E-2	$2,799.20	$2,799.20	$2,799.20	$2,799.20	$2,799.20	$2,799.20	$2,799.20
E-1	$2,600.60	$2,600.60	$2,600.60	$2,600.60	$2,600.60	$2,600.60	$2,600.60
E-1 fewer than four months	$1,773.00						

SOURCE: U.S. House of Representatives, House Appropriations Committee, 2023.

TABLE C.6

Civilian Pay Catch-Up Proposal: Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-5	$2,892.21	$,3113.65	$3,265.90	$3,415.04	$3,557.96	$3,723.11	$3,851.70
E-4	$2,803.92	$2,947.39	$3,106.99	$3,264.58	$3,404.02	$3,404.02	$3,404.02
E-3	$2,531.09	$2,690.35	$2,853.31	$2,853.31	$2,853.31	$2,853.31	$2,853.31
E-2	$2,407.10	$2,407.10	$2,407.10	$2407.10	$2,407.10	$2,407.10	$2,407.10
E-1	$2,147.71	$2,147.71	$2,147.71	$2,147.71	$2,147.71	$2,147.71	$2,147.71
E-1 fewer than four months	$1,985.76						

NOTE: Basic pay for E-6 under this proposal is the same as the baseline 2023 pay table shown in Table A.3.

TABLE C.7

Recruiting Catch-Up Proposal (7%): Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-4	$2,678.80	$2,815.80	$2,968.30	$3,118.80	$3,252.10	$3,252.10	$3,252.10
E-3	$2,418.10	$2,570.30	$2,725.90	$2,725.90	$2,725.90	$2,725.90	$2,725.90
E-2	$2,299.60	$2,299.60	$2,299.60	$2,299.60	$2,299.60	$2,299.60	$2,299.60
E-1	$2,051.80	$2,051.80	$2,051.80	$2,051.80	$2,051.80	$2,051.80	$2,051.80
E-1 fewer than four months	$1,897.10						

NOTE: Basic pay for E-5 and E-6 under this proposal is the same as the baseline 2023 pay table shown in Table A.3.

TABLE C.8

Recruiting Catch-Up Proposal (15%): Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-5	$2,929.80	$3,153.10	$3,307.50	$3,458.80	$3,603.60	$3,768.70	$3,851.70
E-4	$2,879.00	$3,026.30	$3,190.20	$3,352.00	$3,495.20	$3,495.20	$3,495.20
E-3	$2,598.00	$2,762.40	$2,929.70	$2,929.70	$2,929.70	$2,929.70	$2,929.70
E-2	$2,471.60	$2,471.60	$2,471.60	$2,471.60	$2,471.60	$2,471.60	$2,471.60
E-1	$2,205.20	$2,205.20	$2,205.20	$2,205.20	$2,205.20	$2,205.20	$2,205.20
E-1 fewer than four months	$2,039.00						

NOTE: Basic pay for E-6 under this proposal is the same as the baseline 2023 pay table shown in Table A.3.

TABLE C.9

All-Volunteer Force Catch-Up Proposal: Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-4	$2,626.00	$2,717.60	$2,876.20	$3,112.40	$3,249.40	$3,249.40	$3,249.40
E-3	$2,525.70	$2,611.40	$2,716.80	$2,832.10	$2,832.10	$2,832.10	$2,832.10
E-2	$2,429.40	$2,429.40	$2,429.40	$2,429.40	$2,429.40	$2,429.40	$2,429.40
E-1	$2,180.60	$2,180.60	$2,180.60	$2,180.60	$2,180.60	$2,180.60	$2,180.60
E-1 fewer than four months	$2,180.60						

NOTE: Basic pay for E-5 and E-6 under this proposal is the same as the baseline 2023 pay table shown in Table A.3.

TABLE C.10

Boot Camp Catch-Up Proposal: Monthly Basic Pay for E-1 to E-4 with Fewer Than 12 Years of Service, January 2023

Pay Grade	Fewer Than 2 YOS	2 YOS	3 YOS	4 YOS	6 YOS	8 YOS	10 YOS
E-4	$2,503.50	$2,631.60	$2,774.10	$2,914.80	$3,039.30	$3,039.30	$3,039.30
E-3	$2,259.90	$2,402.10	$2,547.60	$2,547.60	$2,547.60	$2,547.60	$2,547.60
E-2	$2,149.20	$2,149.20	$2,149.20	$2,149.20	$2,149.20	$2,149.20	$2,149.20
E-1	$1,917.60	$1,917.60	$1,917.60	$1,917.60	$1,917.60	$1,917.60	$1,917.60
E-1 fewer than four months	$1,917.60						

TABLE C.11

Estimated Change in High-Quality Enlistment Elasticities from Past Studies

Authors	Service	Data Type and Period Covered	Relative Pay Elasticity Estimate	Enlistment Bonus Elasticity Estimate	Recruiters Elasticity Estimate
Ward et al., 2023	Army	Monthly, by company, 2012–2018	–.25 (min. wage)	0.05–0.11	0.29
Knapp et al., 2018	Army	Monthly, by company, 2012–2015		0.04–0.13[a]	0.15–0.60[b]
Goldberg, Kimko, and Li, 2015	Army	Monthly, by battalion, 1995–2013	0.585		0.47
Asch et al., 2010	Army	Quarterly, by state, 2000–2008	1.15	0.05–0.17	0.57–0.63
	Navy	Quarterly, by state, 2000–2008	0.73		
Simon and Warner, 2007	Army	Quarterly, by state, 1996–2005	0.7		0.47
Simon and Warner, 2007	Army	Quarterly, by state, 2004–2005	1.065		0.48
Warner and Simon, 2004	Army	Quarterly, by state, 1989–2003	0.71–0.81		0.53–0.707
	Navy	Quarterly, by state, 1989–2003	0.62		0.53
	Air Force	Quarterly, by state, 1989–2003	0.4		0.57
	Marine Corps	Quarterly, by state, 1989–2003	0.64		0.59
Warner, Curtis, and Payne, 2003	Army	Monthly, by state, 1989–1997	0.78	0.12	0.41
	Navy	Monthly, by state, 1989–1997	0.95	0.024	0.64
	Air Force	Monthly, by state, 1989–1997	0.47		
	Marine Corps	Monthly, by state, 1989–1997	0.23		
Dertouzos and Garber, 2003	Army	Monthly, males by Military Entrance Processing Station, 1993–1997	–0.36 Civilian pay		0.109
Hogan et al., 1996	Navy	Monthly, Navy Recruiting District, 1990–1994	0.55		0.28
Murray and McDonald, 1999	Army	Monthly, by Census Public Use Microdata Area (PUMA), 1993–1997			0.60

Table C.11—Continued

Authors	Service	Data Type and Period Covered	Relative Pay Elasticity Estimate	Enlistment Bonus Elasticity Estimate	Recruiters Elasticity Estimate
	Marine Corps	Monthly, by Census PUMA, 1993–1997			0.62
	Air Force	Monthly, by Census PUMA, 1993–1997			0.59
	Navy	Monthly, by Census PUMA, 1993–1997			0.53
Hogan et al., 2000	Army	Quarterly, by zip code, 1994–1997			0.419–0.863
	Navy	Quarterly, by zip code, 1994–1997			0.228–0.44
Mean of above, except Dertouzos and Garber, 2003, and Ward et al., 2023	Army only		0.764	0.083	0.504
	Navy only		0.713		
	Air Force only		0.435		
	Marine Corps only		0.435		
Mean of above, except Dertouzos and Garber, 2003, and Ward et al., 2023	Various	After drawdown	0.693	0.077	0.503

SOURCE: Some entries in table drawn from Table 1 in Warner, 2012.

NOTE: An elasticity shows the percentage change in high-quality enlistments associated with a 1-percent change in military pay relative to civilian pay. For example, an elasticity of .693 means that a 1-percent increase in military pay is estimated to increase high-quality enlistments by 0.693 percent.

[a] Estimate varies with level the enlistment bonus and the percent of recruits eligible for the bonus.

[b] Estimate varies with the number of recruiters and whether and by how much the recruiters' mission changes when the number of recruiters change.

TABLE C.12

Annual 2023 Basic Pay in the First Four Years of Service Under the Current Pay Table and Under the Alternative Proposals

	Years of Service			
Proposal	1	2	3	4
2023 annual basic pay	$25,326.00	$28,580.40	$31,579.20	$35,538.00
1. Proposal of Representative Mike Garcia	$31,200.00	$31,200.00	$31,579.20	$35,538.00
2. HAC proposal	$31,122.00	$35,468.40	$36,727.20	$38,002.00
3. Junior civilian pay catch-up proposal	$28,365.12	$32,010.05	$35,368.70	$38,555.14
4a. Recruiting catch-up proposal (7%)	$27,098.82	$30,581.03	$33,789.74	$36,314.75
4b. Recruiting catch-up proposal (15%)	$29,124.90	$32,867.46	$36,316.08	$39,220.92
5. AVF catch-up proposal	$28,984.11	$30,909.97	$32,610.72	$35,946.31
6. Boot camp pay catch-up proposal	$25,759.80	$28,580.40	$31,579.20	$35,538.00

NOTE: Annual pay is computed using average promotion times to each grade across services.

TABLE C.13

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under the Proposals: Army Enlisted Personnel, Under Scenario B

Proposal	Percentage Change in Retention Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Annual cost to Army ($Billions per Year)	Annual cost to DoD ($Billions per Year)
1. Proposal of Representative Mike Garcia	4.2%	3.5%	0.82	0.617	1.684
2. HAC proposal	16.7%	8.9%	0.54	1.420	3.869
3. Junior civilian pay catch-up proposal	12.0%	5.4%	0.45	1.036	2.954
4a. Recruiting catch-up proposal (7%)	7.0%	3.3%	0.46	0.516	1.463
4b. Recruiting catch-up proposal (15%)	14.8%	6.6%	0.45	1.297	3.708
5. AVF catch-up proposal	5.2%	2.8%	0.54	0.583	1.712
6. Boot camp pay catch-up proposal	0.3%	0.2%	0.77	0.018	0.046

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs per service member include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Annual costs in the last two columns include basic pay cost and retirement accrual cost only. Results shown are relative to the baseline for Scenario B. Scenario B assumes no permanent change in civilian pay, as shown in Figure 3.2. Scenario A results, assuming a change in civilian pay, are shown in Table 3.7.

TABLE C.14

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under the Proposals: Navy, Department of the Air Force, and Marine Corps Enlisted Personnel, Under Scenario B (No Permanent Change in Civilian Pay)

Proposal	Percentage Change in Retention Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Annual Cost ($Billions per Year)
Navy				
1. Proposal of Representative Mike Garcia	2.8%	2.6%	0.95	$0.418
2. HAC proposal	10.3%	6.6%	0.64	$0.812
3. Junior civilian pay catch-up proposal	7.4%	3.7%	0.51	$0.721
4a. Recruiting catch-up proposal (7%)	4.4%	2.2%	0.49	$0.348
4b. Recruiting catch-up proposal (15%)	9.2%	4.7%	0.51	$0.908
5. AVF catch-up proposal	3.3%	2.0%	0.59	$0.347
6. Boot camp pay catch-up proposal	0.2%	0.2%	1.13	$0.012
Department of the Air Force				
1. Proposal of Representative Mike Garcia	1.4%	1.7%	1.23	$0.384
2. HAC proposal	6.1%	4.4%	0.72	$0.857
3. Junior civilian pay catch-up proposal	4.8%	2.5%	0.52	$0.687

Table C.14—Continued

Proposal	Percentage Change in Retention Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Annual Cost ($Billions per Year)
4a. Recruiting catch-up proposal (7%)	2.8%	1.4%	0.51	$0.334
4b. Recruiting catch-up proposal (15%)	5.9%	3.1%	0.53	$0.864
5. AVF catch-up proposal	2.3%	1.3%	0.55	$0.361
6. Boot camp pay catch-up proposal	0.1%	0.1%	1.43	$0.009
Marine Corps				
1. Proposal of Representative Mike Garcia	0.9%	3.2%	3.38	$0.327
2. HAC proposal	3.6%	7.9%	2.17	$0.780
3. Junior civilian pay catch-up proposal	2.7%	4.4%	1.64	$0.511
4a. Recruiting catch-up proposal (7%)	1.6%	2.5%	1.61	$0.265
4b. Recruiting catch-up proposal (15%)	3.3%	5.5%	1.66	$0.639
5. AVF catch-up proposal	1.4%	2.4%	1.77	$0.359
6. Boot camp pay catch-up proposal	0.0%	0.2%	4.95	$0.007

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs per service member include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Annual costs in the last two columns include basic pay cost and retirement accrual cost only. Results shown are relative to the baseline for Scenario B. Scenario B assumes no permanent change in civilian pay.

TABLE C.15

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under the Proposals: Navy, Department of the Air Force, and Marine Corps Enlisted Personnel, Under Scenario A (Permanent Change in Civilian Pay)

Proposal	Percentage Change in Retention Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Annual Cost ($Billions per Year)
Navy				
1. Proposal of Representative Mike Garcia	2.5%	2.2%	0.88	$0.418
2. HAC proposal	12.5%	7.2%	0.57	$0.812
3. Junior civilian pay catch-up proposal	18.1%	7.3%	0.40	$0.721
4a. Recruiting catch-up proposal (7%)	5.2%	2.4%	0.46	$0.348
4b. Recruiting catch-up proposal (15%)	22.8%	9.0%	0.40	$0.908
5. AVF catch-up proposal	4.0%	2.2%	0.54	$0.347
6. Boot camp pay catch-up proposal	0.2%	0.2%	1.02	$0.012

Table C.15—Continued

Proposal	Percentage Change in Retention Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Annual Cost ($Billions per Year)
Department of the Air Force				
1. Proposal of Representative Mike Garcia	1.3%	1.4%	1.08	$0.384
2. HAC proposal	7.5%	4.6%	0.62	$0.857
3. Junior civilian pay catch-up proposal	12.8%	4.9%	0.38	$0.687
4a. Recruiting catch-up proposal (7%)	3.4%	1.5%	0.45	$0.334
4b. Recruiting catch-up proposal (15%)	16.4%	6.1%	0.37	$0.864
5. AVF catch-up proposal	2.7%	1.4%	0.51	$0.361
6. Boot camp pay catch-up proposal	0.1%	0.1%	1.11	$0.009
Marine Corps				
1. Proposal of Representative Mike Garcia	0.7%	2.5%	3.42	$0.327
2. HAC proposal	3.9%	8.0%	2.02	$0.780
3. Junior civilian pay catch-up proposal	5.5%	6.3%	1.14	$0.511
4a. Recruiting catch-up proposal (7%)	1.6%	2.6%	1.57	$0.265
4b. Recruiting catch-up proposal (15%)	6.9%	7.8%	1.13	$0.639
5. AVF catch-up proposal	1.4%	2.4%	1.78	$0.359
6. Boot camp pay catch-up proposal	0.1%	0.2%	3.24	$0.007

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs per service member include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Annual costs in the last two columns include basic pay cost and retirement accrual cost only. Results shown are relative to the baseline for Scenario A. Scenario A assumes a permanent change in civilian pay of 8 percent.

APPENDIX D

Supplementary Tables and Figures for Chapter 4

This appendix provides supplementary material for Chapter 4.

TABLE D.1

Proposal 1, Adding E-10 Grade: Monthly Basic Pay for E-6 to E-10 with More Than Six Years of Service, January 2023

Pay Grade	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
E-10	$00.00[a]	$00.00[a]	$00.00[a]	$7,245.70[a]	$7,447.90[a]	$7,685.50[a]	$7,926.60[a]	$8,310.30[a]	$8,636.40[a]	$8,978.20[a]	$9,502.30[a]	$9,502.30[a]	$9,976.50[a]	$9,976.50[a]	$10,475.90[a]	$10,475.90[a]	$10,475.90[a]	$10,475.90[a]
E-9	$00.00	$00.00	$6,055.50	$6,192.90	$6,365.70	$6,568.80	$6,774.90	$7,102.80	$7,381.50	$7,673.70	$8,121.60	$8,121.60	$8,526.90	$8,526.90	$8,953.80	$8,953.80	$9,402.30	$9,402.30
E-8	$00.00	$4,957.20	$5,176.50	$5,312.10	$5,474.70	$5,650.80	$5,968.80	$6,130.20	$6,404.40	$6,556.50	$6,930.90	$6,930.90	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80
E-7	$4,244.70	$4,500.60	$4,644.90	$4,900.50	$5,113.50	$5,258.70	$5,413.50	$5,473.20	$5,674.50	$5,782.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50
E-6	$3,711.90	$4,042.20	$4,170.90	$4,419.90	$4,496.10	$4,551.30	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40

[a] Shaded cells indicate changes from the 2023 basic pay table.

TABLE D.2

Proposal 2, Adding E-10 Grade and Targeted E-6 Through E-9 Raises: Monthly Basic Pay for E-6 to E-10 with More Than Six Years of Service, January 2023

Pay Grade	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
E-10	$00.00[a]	$00.00[a]	$00.00[a]	$7,245.70[a]	$7,447.90[a]	$7,685.50[a]	$8,240.50[a]	$8,463.40[a]	$8,636.40[a]	$8,978.20[a]	$9,502.30[a]	$9,502.30[a]	$9,976.50[a]	$9,976.50[a]	$10,475.90[a]	$10,475.90[a]	$11,000.70[a]	$11,000.70[a]
E-9	$00.00	$00.00	$6,055.50	$6,192.90	$6,365.70	$6,568.80	$7,043.20[a]	$7,233.04[a]	$7,381.50	$7,673.70	$8,121.60	$8,121.60	$8,526.90	$8,526.90	$8,953.80	$8,953.80	$9,402.30	$9,402.30
E-8	$00.00	$4,957.20	$5,176.50	$5,312.10	$5,829.40[a]	$5,889.70[a]	$5,968.80	$6,130.20	$6,404.40	$6,556.50	$6,930.90	$6,930.90	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80
E-7	$4,244.70	$4,500.60	$4,766.50[a]	$4,900.50	$5,113.50	$5,258.70	$5,413.50	$5,473.20	$5,674.50	$5,782.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50
E-6	$3,851.90[a]	$4,097.50[a]	$4,236.90[a]	$4,419.90	$4,496.10	$4,551.30	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40

[a] Shaded cells indicate changes from the 2023 basic pay table.

TABLE D.3

Proposal 3, Adding E-10 Grade and Targeted E-6 Through E-7 Raises: Monthly Basic Pay for E-6 to E-10 with More Than Six Years of Service, January 2023

Pay Grade	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
E-10	$00.00[a]	$00.00[a]	$00.00[a]	$7,245.70[a]	$7,447.90[a]	$7,685.50[a]	$7,926.60[a]	$8,310.30[a]	$8,636.40[a]	$8,978.20[a]	$9,502.30[a]	$9,502.30[a]	$9,976.50[a]	$9,976.50[a]	$10,475.90[a]	$10,475.90[a]	$11,000.70[a]	$11,000.70[a]
E-9	$00.00	$00.00	$6,055.50	$6,192.90	$6,365.70	$6,568.80	$6,774.90	$7,102.80	$7,381.50	$7,673.70	$8,121.60	$8,121.60	$8,526.90	$8,526.90	$8,953.80	$8,953.80	$9,402.30	$9,402.30
E-8	$00.00	$4,957.20	$5,176.50	$5,312.10	$5,474.70	$5,650.80	$5,968.80	$6,130.20	$6,404.40	$6,556.50	$6,930.90	$6,930.90	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80
E-7	$4,244.70	$4,500.60	$4,766.50[a]	$4,900.50	$5,113.50	$5,258.70	$5,413.50	$5,473.20	$5,674.50	$5,782.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50
E-6	$3,851.90[a]	$4,097.50[a]	$4,236.90[a]	$4,419.90	$4,496.10	$4,551.30	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40

[a] Shaded cells indicate changes from the 2023 basic pay table.

TABLE D.4

Proposal 4, Targeted E-6 Through E-9 Raises: Monthly Basic Pay for E-6 to E-10 with More Than Six Years of Service, January 2023

Pay Grade	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
E-9	$00.00	$00.00	$6,055.50	$6,192.90	$6,365.70	$6,568.80	$7,043.20[a]	$7,233.40[a]	$7,381.50	$7,673.70	$8,121.60	$8,121.60	$8,526.90	$8,526.90	$8,953.80	$8,953.80	$9,402.30	$9,402.30
E-8	$00.00	$4,957.20	$5,176.50	$5,312.10	$5,829.40[a]	$5,889.70[a]	$5,968.80	$6,130.20	$6,404.40	$6,556.50	$6,930.90	$6,930.90	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80	$7,069.80
E-7	$4,244.70	$4,500.60	$4,766.50[a]	$4,900.50	$5,113.50	$5,258.70	$5,413.50	$5,473.20	$5,674.50	$5,782.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50	$6,193.50
E-6	$3,851.90[a]	$4,097.50[a]	$4,236.90[a]	$4,419.90	$4,496.10	$4,551.30	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40	$4,616.40

[a] Shaded cells indicate changes from the 2023 basic pay table.

Assuming 10 Percent of E-9s Are Promoted to E-10

TABLE D.5

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Navy Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Navy Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	5.272	$79,152			
1. Add E-10 grade	0.3%	0.3%	1.15	$0.006	$0.021
2. Add E-10 grade plus targeted E-6 to E-9 raises	4.4%	2.6%	0.59	$0.036	$0.153
3. Add E-10 grade plus targeted E-6 to E-7 raises	4.2%	2.5%	0.58	$0.031	$0.128
4. Targeted E-6 to E-9 raises, no E-10 addition	4.1%	2.3%	0.56	$0.030	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. The results shown in the table assume that 10 percent of E-9s are promoted to E-10.

TABLE D.6

Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Navy Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	47.8	43.1	63.6	N/A
1. Add E-10 grade	47.8	43.1	61.6	72.6
2. Add E-10 grade plus targeted E-6 to E-9 raises	48.3	43.4	63.0	72.3
3. Add E-10 grade plus targeted E-6 to E-7 raises	48.1	43.3	62.4	73.8
4. Targeted E-6 to E-9 raises, no E-10 addition	48.2	43.4	64.4	N/A

SOURCE: Authors' calculations using RAND's DRM.

TABLE D.7

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Department of the Air Force Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Department of the Air Force Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	7.940	$88,161			
1. Add E-10 grade	0.4%	0.4%	1.00	$0.005	$0.021
2. Add E-10 grade plus targeted E-6 to E-9 raises	4.2%	2.1%	0.50	$0.031	$0.153
3. Add E-10 grade plus targeted E-6 to E-7 raises	4.0%	1.9%	0.49	$0.027	$0.128
4. Targeted E-6 to E-9 raises, no E-10 addition	3.8%	1.7%	0.45	$0.026	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. The results shown in the table assume that 10 percent of E-9s are promoted to E-10.

TABLE D.8

Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Department of the Air Force Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	46.4	42.1	57.4	N/A
1. Add E-10 grade	46.4	42.1	56.4	63.1
2. Add E-10 grade plus targeted E-6 to E-9 raises	46.9	42.4	57.8	63.3
3. Add E-10 grade plus targeted E-6 to E-7 raises	46.7	42.3	57.5	63.1
4. Targeted E-6 to E-9 raises, no E-10 addition	46.9	42.4	58.3	N/A

SOURCE: Authors' calculations using RAND's DRM.

TABLE D.9

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Marine Corps Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Marine Corps Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	5.303	$79,260			
1. Add E-10 grade	0.1%	0.3%	1.85	$0.003	$0.021
2. Add E-10 grade plus targeted E-6 to E-9 raises	1.2%	1.1%	0.93	$0.018	$0.153
3. Add E-10 grade plus targeted E-6 to E-7 raises	1.2%	1.0%	0.89	$0.015	$0.128
4. Targeted E-6 to E-9 raises, no E-10 addition	1.0%	0.8%	0.81	$0.014	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. The results shown in the table assume 10 percent of E-9s are promoted to E-10.

TABLE D.10

Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Marine Corps Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	49.9	45.4	63.3	N/A
1. Add E-10 grade	49.9	45.4	62.4	68.6
2. Add E-10 grade plus targeted E-6 to E-9 raises	49.8	45.4	62.1	68.6
3. Add E-10 grade plus targeted E-6 to E-7 raises	49.8	45.4	62.1	68.6
4. Targeted E-6 to E-9 raises, no E-10 addition	49.8	45.4	63.0	N/A

SOURCE: Authors' calculations using RAND's DRM.

Assuming 50 Percent of E-9s Are Promoted to E-10

TABLE D.11

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Army Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Army Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	4.547	$74,682			
1. Add E-10 grade	1.2%	1.4%	1.16	$0.033	$0.103
2. Add E-10 grade plus targeted E-6 to E-9 raises	7.1%	4.8%	0.68	$0.095	$0.236
3. Add E-10 grade plus targeted E-6 to E-7 raises	6.7%	4.6%	0.68	$0.082	$0.211
4. Targeted E-6 to E-9 raises, no E-10 addition	5.6%	3.2%	0.57	$0.062	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. The results shown in the table assume that 50 percent of E-9s are promoted to E-10.

TABLE D.12

Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Army Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	46.8	41.6	59.2	N/A
1. Add E-10 grade	46.9	41.6	54.7	59.6
2. Add E-10 grade plus targeted E-6 to E-9 raises	47.5	42.1	57.8	62.8
3. Add E-10 grade plus targeted E-6 to E-7 raises	47.2	41.9	56.7	62.2
4. Targeted E-6 to E-9 raises, no E-10 addition	47.4	42.0	62.2	N/A

SOURCE: Authors' calculations using RAND's DRM.

TABLE D.13

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Navy Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Navy Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline					
1. Add E-10 grade	1.6%	1.8%	1.17	$0.028	$0.103
2. Add E-10 grade plus targeted E-6 to E-9 raises	6.0%	4.3%	0.72	$0.058	$0.236
3. Add E-10 grade plus targeted E-6 to E-7 raises	5.7%	4.1%	0.72	$0.053	$0.211
4. Targeted E-6 to E-9 raises, no E-10 addition	4.1%	2.3%	0.56	$0.030	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. The results shown in the table assume that 50 percent of E-9s are promoted to E-10.

TABLE D.14

Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Navy Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	47.8	43.1	63.6	N/A
1. Add E-10 grade	47.9	43.1	57.3	64.0
2. Add E-10 grade plus targeted E-6 to E-9 raises	48.3	43.5	59.0	64.6
3. Add E-10 grade plus targeted E-6 to E-7 raises	48.2	43.4	58.1	64.6
4. Targeted E-6 to E-9 raises, no E-10 addition	48.2	43.4	64.4	N/A

SOURCE: Authors' calculations using RAND's DRM.

TABLE D.15

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Department of the Air Force Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Department of the Air Force Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	7.940	$88,161			
1. Add E-10 grade	2.0%	2.0%	1.01	$0.026	$0.103
2. Add E-10 grade plus targeted E-6 to E-9 raises	5.9%	3.7%	0.63	$0.052	$0.236
3. Add E-10 grade plus targeted E-6 to E-7 raises	5.6%	3.6%	0.63	$0.048	$0.211
4. Targeted E-6 to E-9 raises, no E-10 addition	3.8%	1.7%	0.45	$0.026	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. The results shown in the table assume that 50 percent of E-9s are promoted to E-10.

TABLE D.16

Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Department of the Air Force Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	46.4	42.1	57.4	N/A
1. Add E-10 grade	46.5	42.1	53.7	58.6
2. Add E-10 grade plus targeted E-6 to E-9 raises	47.0	42.4	55.0	59.7
3. Add E-10 grade plus targeted E-6 to E-7 raises	46.8	42.4	54.6	59.3
4. Targeted E-6 to E-9 raises, no E-10 addition	46.9	42.4	58.3	N/A

SOURCE: Authors' calculations using RAND's DRM.

TABLE D.17

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Marine Corps Enlisted Personnel

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Marine Corps Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	5.303	$79,260			
1. Add E-10 grade	0.8%	1.3%	1.71	$0.016	$0.103
2. Add E-10 grade plus targeted E-6 to E-9 raises	1.8%	2.2%	1.20	$0.030	$0.236
3. Add E-10 grade plus targeted E-6 to E-7 raises	1.8%	2.1%	1.18	$0.027	$0.211
4. Targeted E-6 to E-9 raises, no E-10 addition	1.0%	0.8%	0.81	$0.014	$0.133

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline. The results shown in the table assume that 50 percent of E-9s are promoted to E-10.

TABLE D.18

Average Ability Percentile by Grade, and Across the Overall Force, Under Four Proposals, Assuming 50 Percent of E-9s Are Promoted to E-10, Marine Corps Enlisted Personnel

Proposal	Overall Force	E-5	E-9	E-10
Baseline	49.9	45.4	63.3	N/A
1. Add E-10 grade	49.8	45.4	58.7	63.9
2. Add E-10 grade plus targeted E-6 to E-9 raises	49.8	45.4	58.5	63.6
3. Add E-10 grade plus targeted E-6 to E-7 raises	49.8	45.4	58.5	63.6
4. Targeted E-6 to E-9 raises, no E-10 addition	49.8	45.4	63.0	N/A

SOURCE: Authors' calculations using RAND's DRM.

APPENDIX E

Supplementary Tables for Chapter 5

This appendix provides supplementary tables for Chapter 5.

TABLE E.1

Monthly Basic Pay for O-4 to O-10 with More Than Four Years of Service, January 2023

Pay Grade	4 YOS	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
O-10	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10
O-9	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$17,201.40	$17,449.80	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10
O-8	$12,908.10	$13,238.40	$13,789.50	$13,918.20	$14,441.70	$14,592.60	$15,043.50	$15,696.60	$16,298.10	$16,700.10	$16,700.10	$16,700.10	$16,700.10	$17,118.30	$17,118.30	$17,545.80	$17,545.80	$17,545.80	$17,545.80
O-7	$10,973.40	$11,286.00	$11,595.30	$11,952.60	$12,308.70	$12,666.60	$13,789.50	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10
O-6	$8,978.10	$9,012.60	$9,398.70	$9,450.00	$9,450.00	$9,987.00	$10,936.20	$11,493.60	$12,050.40	$12,367.50	$12,688.80	$13,310.70	$13,310.70	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50
O-5	$7,794.30	$8,105.70	$8,291.40	$8,700.60	$9,001.80	$9,389.70	$9,982.80	$10,265.40	$10,544.70	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80
O-4	$6,906.30	$7,301.70	$7,726.20	$8,254.80	$8,665.50	$8,951.10	$9,115.50	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30

SOURCE: DoD, OUSD(P&R), 2023.

TABLE E.2

Proposal 1, Targeted O-4 Through O-6 Raises: Monthly Basic Pay for O-4s to O-10s with More Than Four Years of Service, January 2023

Pay Grade	4 YOS	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
O-10	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10
O-9	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$17,201.40	$17,449.80	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10
O-8	$12,908.10	$13,238.40	$13,789.50	$13,918.20	$14,441.70	$14,592.60	$15,043.50	$15,696.60	$16,298.10	$16,700.10	$16,700.10	$16,700.10	$16,700.10	$17,118.30	$17,118.30	$17,545.80	$17,545.80	$17,545.80	$17,545.80
O-7	$10,973.40	$11,286.00	$11,595.30	$11,952.60	$12,308.70	$12,666.60	$13,789.50	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10
O-6	$8,978.10	$9,012.60	$9,398.70	$9,450.00	$9,450.00	$9,987.00	$10,936.20	$11,893.60[a]	$12,050.40	$12,367.50	$12,688.80	$13,310.70	$13,310.70	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50
O-5	$7,794.30	$8,105.70	$8,291.40	$8,700.60	$9,001.80	$9,939.70[a]	$10,087.80[a]	$10,265.40	$10,544.70	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80
O-4	$6,906.30	$7,301.70	$7,976.20[a]	$8,254.80	$8,665.50	$8,951.10	$9,115.50	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30

SOURCE: DoD, OUSD(P&R), 2023.

[a] Shaded cells indicate changes from the 2023 basic pay table.

TABLE E.3

Proposal 2, Targeted O-4 Through O-6 Raises and Executive Schedule I Cap: Monthly Basic Pay for O-4s to O-10s with More Than Four Years of Service, January 2023

Pay Grade	4 YOS	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
O-10	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$18,300.10[a]	$18,300.10[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]
O-9	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$17,201.40	$17,449.80	$17,807.20[a]	$18,431.70[a]	$18,431.70[a]	$19,353.90[a]	$19,353.90[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]	$19,633.30[a]
O-8	$12,908.10	$13,238.40	$13,789.50	$13,918.20	$14,441.70	$14,592.60	$15,043.50	$15,696.60	$16,298.10	$16,700.10	$16,700.10	$16,700.10	$16,900.00[a]	$17,118.30	$17,118.30	$17,545.80	$17,545.80	$17,545.80	$17,545.80
O-7	$10,973.40	$11,286.00	$11,595.30	$11,952.60	$12,308.70	$12,666.60	$13,789.50	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$14,813.70	$14,813.70	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10
O-6	$8,978.10	$9,012.60	$9,398.70	$9,450.00	$9,450.0	$9,987.00	$10,936.20	$11,893.60[a]	$12,050.40	$12,367.50	$12,688.80	$13,310.70	$13,310.70	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50
O-5	$7,794.30	$8,105.70	$8,291.40	$8,700.60	$9,001.80	$9,939.70[a]	$10,087.80[a]	$10,265.40	$10,544.70	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80
O-4	$6,906.30	$7,301.70	$7,976.20[a]	$8,254.80	$8,665.50	$8,951.10	$9,115.50	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30

SOURCE: DoD, OUSD(P&R), 2023.

[a] Shaded cells indicate changes from the 2023 basic pay table.

TABLE E.4

Proposal 3, Targeted O-5 Raise: Monthly Basic Pay for O-4s to O-10s with More Than Four Years of Service, January 2023

Pay Grade	4 YOS	6 YOS	8 YOS	10 YOS	12 YOS	14 YOS	16 YOS	18 YOS	20 YOS	22 YOS	24 YOS	26 YOS	28 YOS	30 YOS	32 YOS	34 YOS	36 YOS	38 YOS	40 YOS
O-10	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10
O-9	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$00.00	$17,201.40	$17,449.80	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10	$17,675.10
O-8	$12,908.10	$13,238.40	$13,789.50	$13,918.20	$14,441.70	$14,592.60	$15,043.50	$15,696.60	$16,298.10	$16,700.10	$16,700.10	$16,700.10	$16,700.10	$17,118.30	$17,118.30	$17,545.80	$17,545.80	$17,545.80	$17,545.80
O-7	$10,973.40	$11,286.00	$11,595.30	$11,952.60	$12,308.70	$12,666.60	$13,789.50	$14,737.80	$14,737.80	$14,737.80	$14,737.80	$14,813.70	$14,813.70	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10	$15,110.10
O-6	$8,978.10	$9,012.60	$9,398.70	$9,450.00	$9,450.00	$9,987.00	$10,936.20	$11,493.60	$12,050.40	$12,367.50	$12,688.80	$13,310.70	$13,310.70	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50	$13,576.50
O-5	$7,794.30	$8,105.70	$8,291.40	$8,700.60	$9,001.80	$9,939.70[a]	$10,087.80[a]	$10,265.40	$10,544.70	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80	$10,861.80
O-4	$6,906.30	$7,301.70	$7,726.20	$8,254.80	$8,665.50	$8,951.10	$9,115.50	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30	$9,210.30

SOURCE: DoD, OUSD(P&R), 2023.

[a] Shaded cells indicate changes from the 2023 basic pay table.

TABLE E.5

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Three Proposals, Navy Officers

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Navy Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	11.5	$148,998			
1. Targeted raises for O-4 to O-6	0.5%	0.5%	0.88	$0.011	$0.039
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	0.6%	0.5%	0.89	$0.012	$0.045
3. Targeted raise for O-5	0.3%	0.3%	0.89	$0.007	$0.027

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline.

TABLE E.6

Average Ability Percentile by Grade, and Across the Overall Force, Under Three Proposals, Navy Officers

Proposal	Overall Force	Field Grade (O-4 to O-6)	Senior Grade (O-7 to O-10)
Baseline	44.9	50.0	63.1
1. Targeted raises for O-4 to O-6	45.0	50.3	63.1
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	45.0	50.3	63.9
3. Targeted raise for O-5	45.0	50.2	63.0

SOURCE: Authors' calculations using RAND's DRM.

TABLE E.7

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Three Proposals, Department of the Air Force Officers

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Department of the Air Force Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	11.0	$152,217	0		
1. Targeted raises for O-4 to O-6	0.7	0.6	0.74	$0.020	$0.039
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	0.8	0.6	0.75	$0.022	$0.045
3. Targeted raise for O-5	0.5	0.3	0.77	$0.015	$0.027

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline.

TABLE E.8

Average Ability Percentile by Grade, and Across the Overall Force, Under Three Proposals, Department of the Air Force Officers

Proposal	Overall Force	Field Grade (O-4 to O-6)	Senior Grade (O-7 to O-10)
Baseline	42.6	39.5	57.9
1. Targeted raises for O-4 to O-6	42.8	39.9	58.4
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	42.8	39.9	58.5
3. Targeted raise for O-5	42.7	39.7	58.2

SOURCE: Authors' calculations using RAND's DRM.

TABLE E.9

Percentage Change in Predicted Steady State Man-Years per Accession, and Cost per Member, Under Three Proposals, Marine Corps Officers

Proposal	Retention: Percentage Change in Man-Years per Accession Relative to Baseline	Percentage Change in Cost per Service Member (2023 Dollars)	Marginal Cost: Ratio of Percentage Change in Cost over Percentage Change in Retention	Increase in Annual Marine Corps Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)	Increase in Annual DoD Basic Pay and Retirement Accrual Cost (Billions of 2023 Dollars)
Baseline	12.6	$158,062			
1. Targeted raises for O-4 to O-6	1.0%	0.6%	0.62	$0.001	$0.039
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	1.0%	0.6%	0.63	$0.001	$0.045
3. Targeted raise for O-5	0.6%	0.4%	0.66	$0.001	$0.027

SOURCE: Authors' calculations using RAND's DRM.

NOTE: Retention is measured in terms of steady state man-years per accession; personnel costs include basic pay, BAH, and BAS costs of the force, as well as legacy military retirement accrual costs. Results shown are relative to the baseline.

TABLE E.10

Average Ability Percentile by Grade, and Across the Overall Force, Under Three Proposals, Marine Corps Officers

Proposal	Overall Force	Field Grade (O-4 to O-6)	Senior Grade (O-7 to O-10)
Baseline	42.4	39.5	56.1
1. Targeted raises for O-4 to O-6	42.7	40.2	56.4
2. Targeted raises for O-4 to O-6, replace ES-II cap with ES-I cap	42.7	40.2	57.0
3. Targeted raise for O-5	42.5	39.9	56.2

SOURCE: Authors' calculations using RAND's DRM.

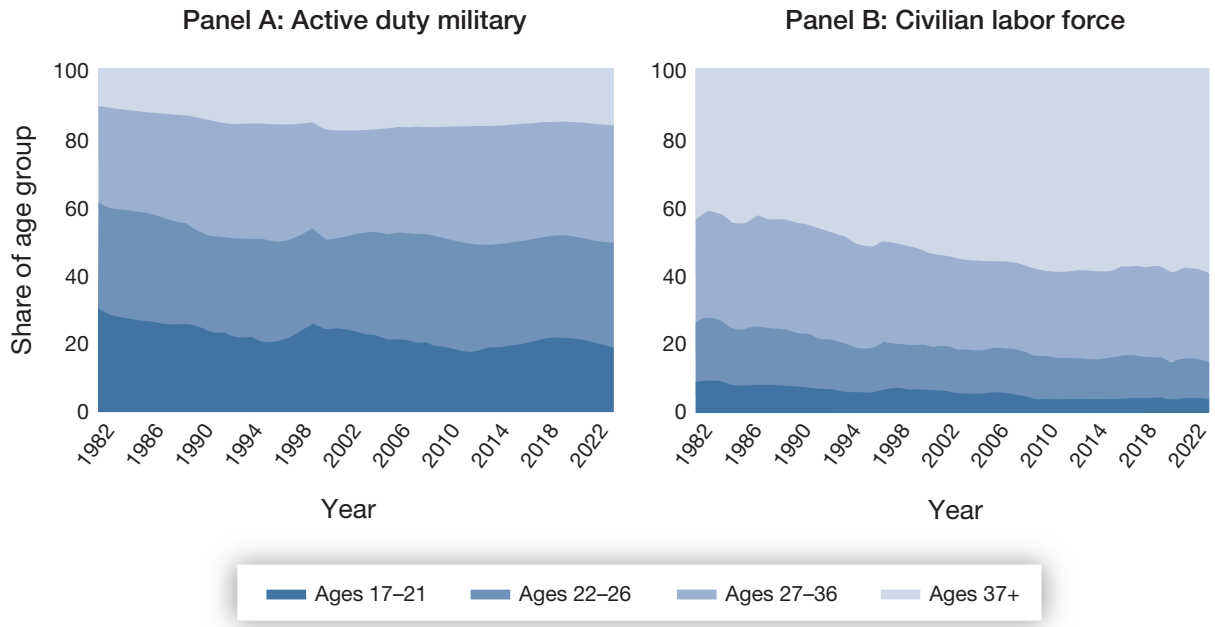
APPENDIX F

Supplementary Figures for Chapter 6

This appendix provides supplementary figures for Chapter 6.

FIGURE F.1

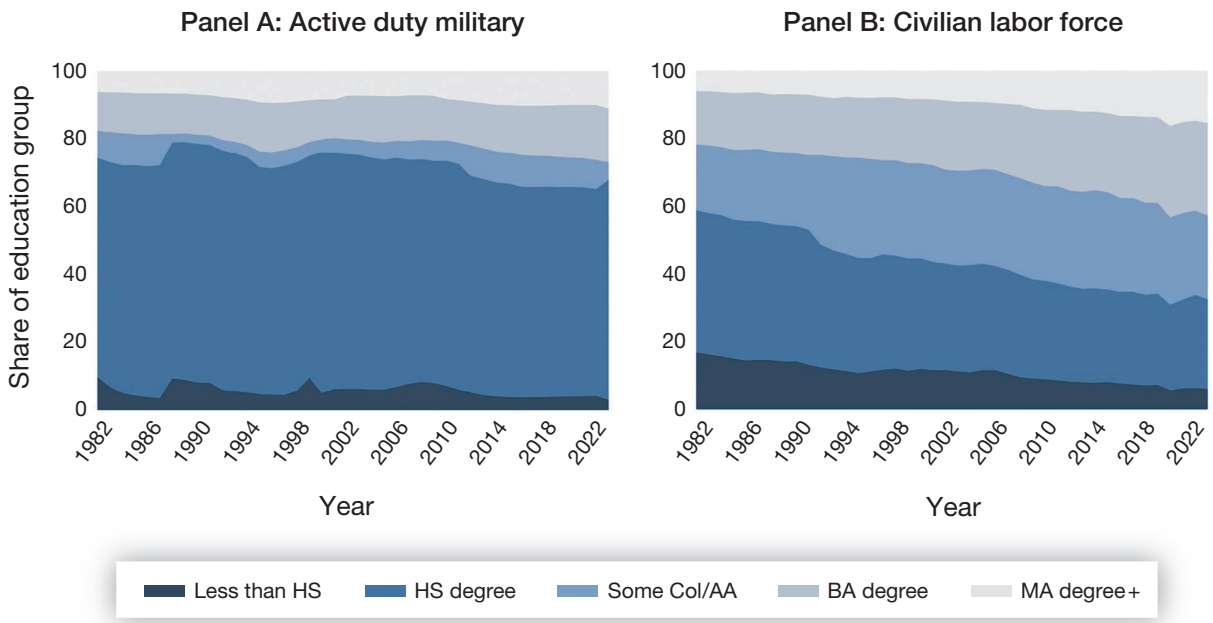
Age Composition of Active Duty Military Members and the Civilian Labor Force over Time



SOURCE: Author calculations from CPS data from IPUMS (Flood et al., 2023) and DMDC data.

FIGURE F.2

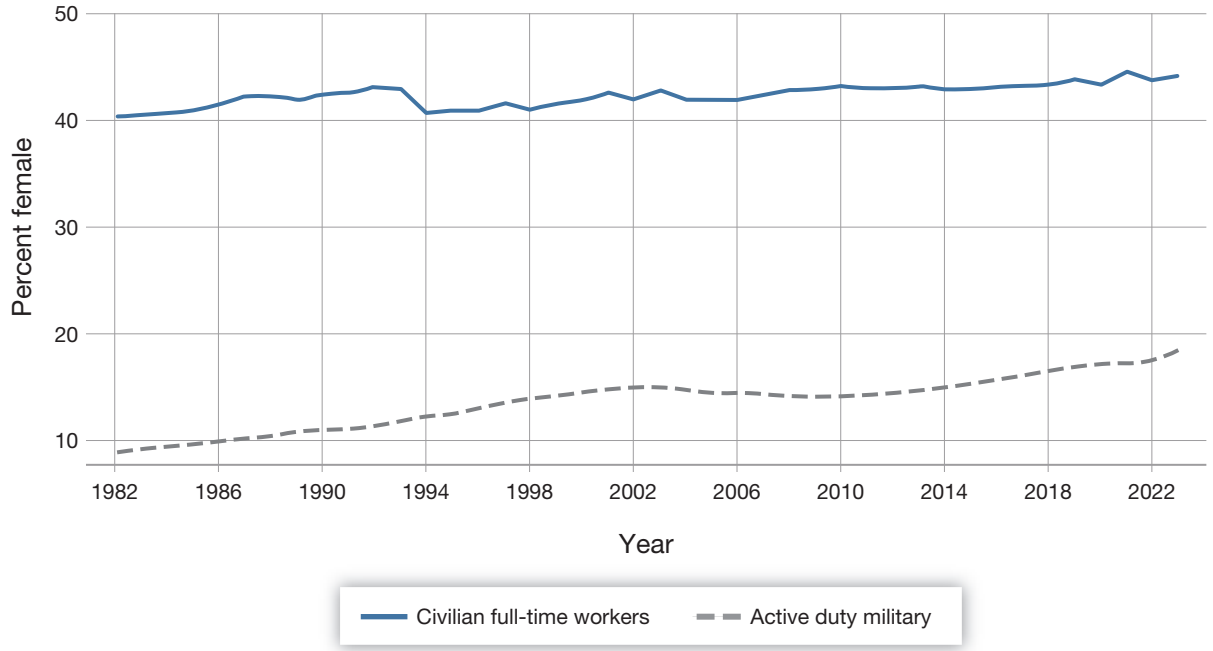
Educational Attainment Level of Active Duty Military Members and the Civilian Labor Force over Time



SOURCE: Author calculations from CPS data from IPUMS (Flood et al., 2023) and DMDC data.
NOTE: HS = high school; MA = master of arts; Col = college; AA = Associate degree

FIGURE F.3

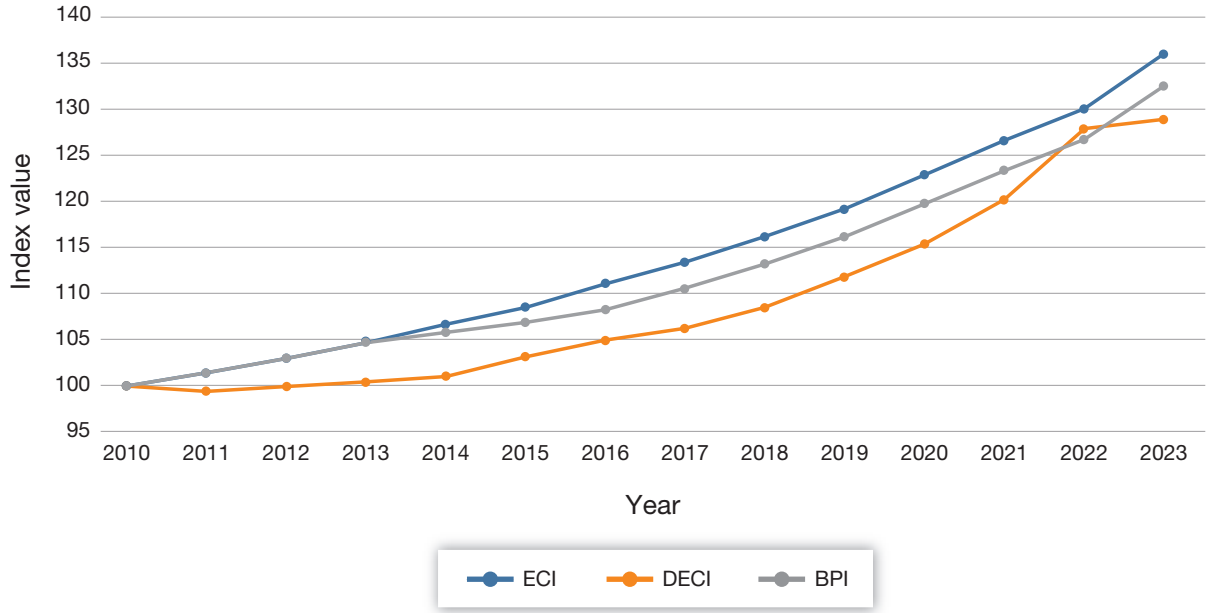
Sex of Active Duty Military Members and the Civilian Labor Force over Time



SOURCE: Author calculations from CPS data from IPUMS (Flood et al., 2023) and DMDC data.

FIGURE F.4

Changes over Time in ECI, DECI, and BPI Using 2010 as the Baseline Year

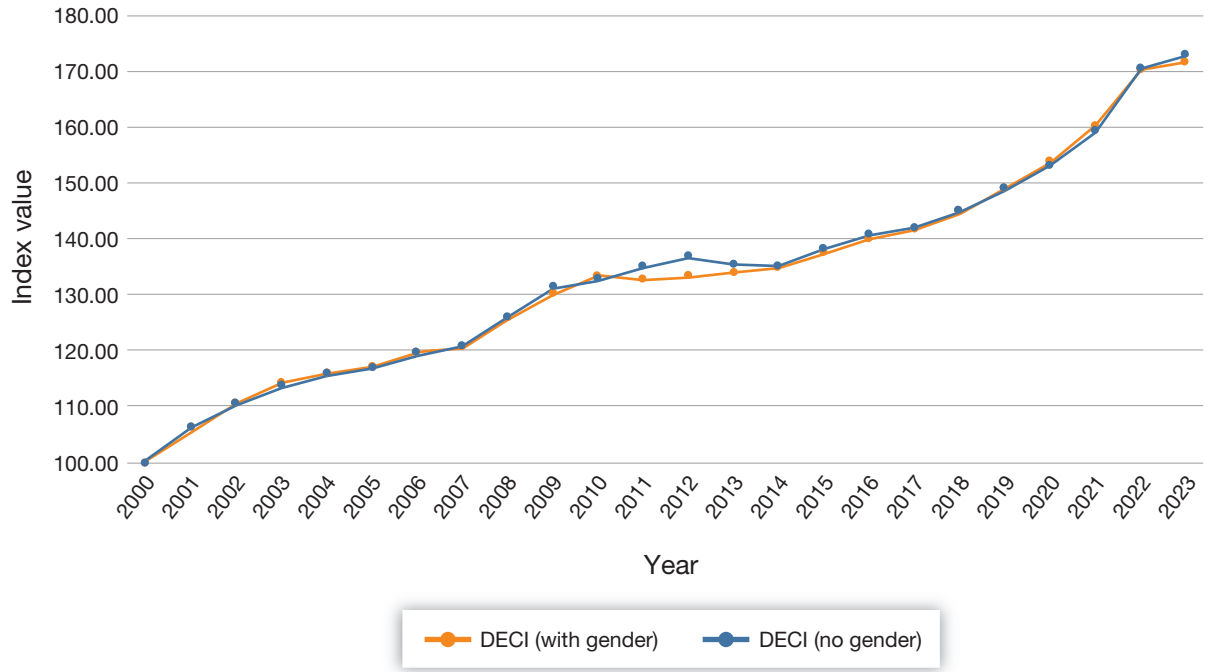


SOURCE: Author calculations from CPS data from IPUMS (Flood et al., 2023), DMDC data, and data on basic pay increases from the Congressional Research Service (and other sources).

NOTE: This and similar figures comparing earnings indexes with the BPI, we lag the earnings index measure by two years to match the 15-month policy-setting timeline so that, for example, the ECI from September 2019 to September 2020 is used to guide the pay increase implemented ultimately in January 2022. We use the same approach with the DECI.

FIGURE F.5

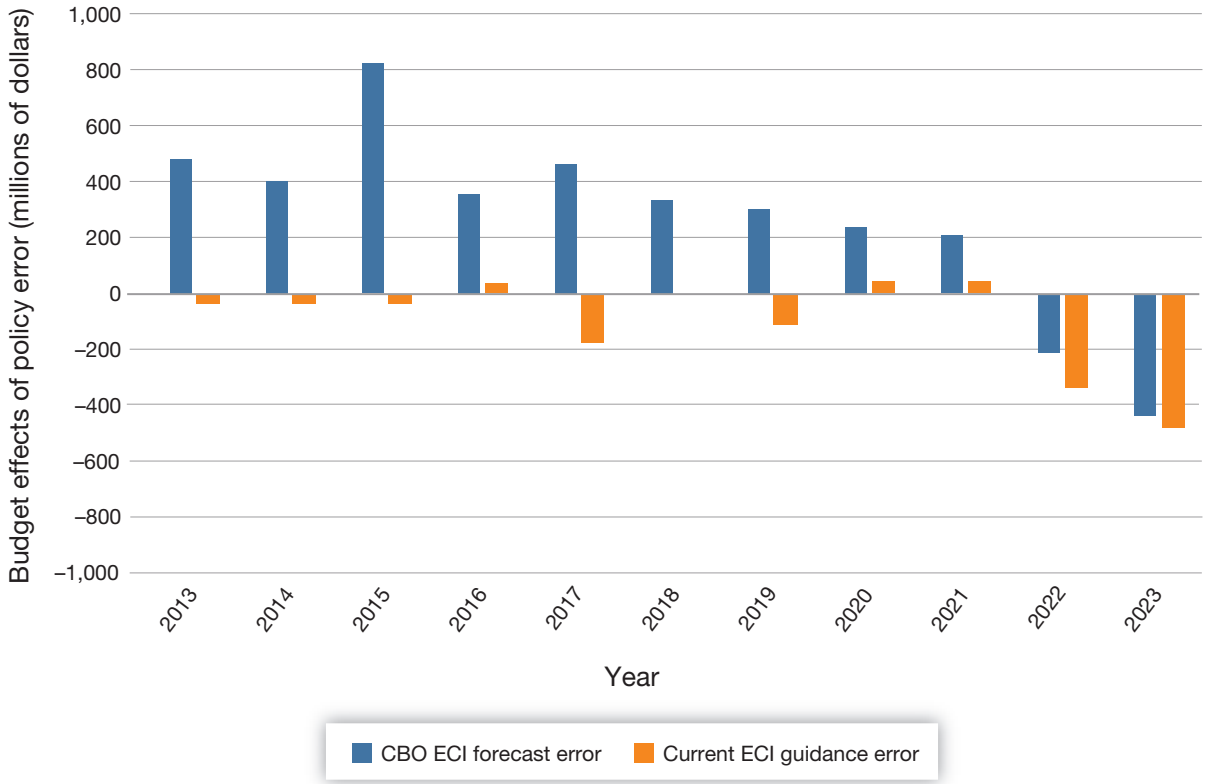
DECI Measures Both Including and Excluding Gender in Weighting



SOURCE: Author calculations from CPS data from IPUMS (Flood et al., 2023) and DMDC data. Note that in this figure we lag the DECI value by two years to match the 15-month policy-setting timeline so that, for example, the DECI from September 2019 to September 2020 is indicated as 2022, since this measure would be used to guide the pay increase ultimately implemented in January 2022.

FIGURE F.6

Fiscal Implications of Using Current ECI Guidance or the Congressional Budget Office ECI Forecast at Start of Budget Process and Then Revising with a Later ECI Measure



SOURCE: Author calculations using data on force size and basic pay by grade and year of service from the Greenbooks (2013–2023), ECI data from the BLS, and ECI forecasts from the CBO.

APPENDIX G

Supplementary Material for Chapter 7

This appendix provides supplementary material for Chapter 7. It includes data for the Department of the Air Force, the Marine Corps, and the Navy.

The Incidence of Special and Incentive Pays

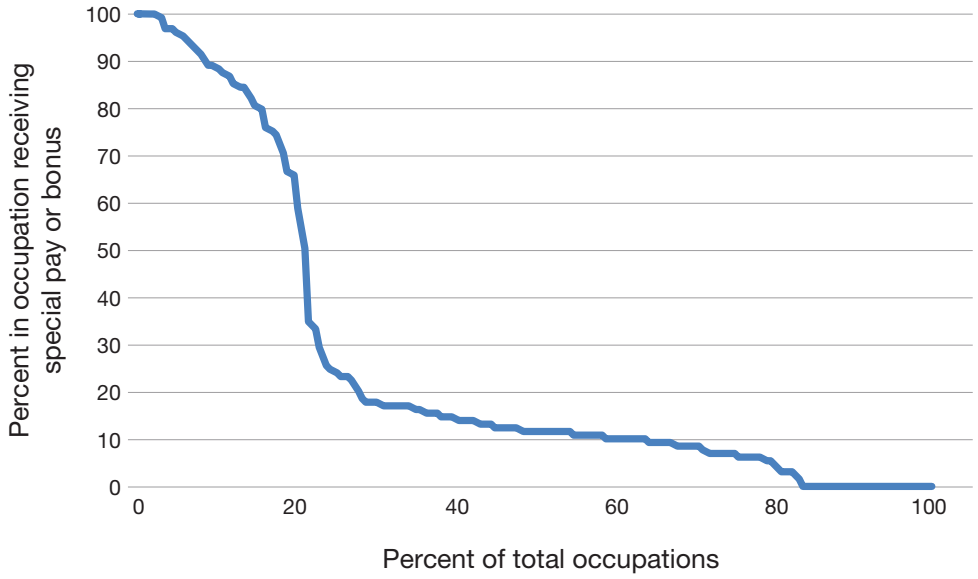
Enlisted Incidence of Special Pays and Bonuses

Department of the Air Force enlisted incidence by occupation, shown in Figure G.1, and Marine Corps enlisted incidence by occupation, shown in Figure G.2, display a similar pattern to that of the Army, with the Department of the Air Force being less skewed and the Marine Corps being more skewed. In both services the incidence of special pays and bonuses are concentrated in a small share of occupations.

The Navy enlisted incidence by occupation, shown in Figure G.3, is much less concentrated than in the Army, Department of the Air Force, or Marine Corps. In the Navy, 40 percent of the occupations show an incidence of 50 percent or more receiving special pay or bonuses, in contrast to 21 percent in the Department of the Air Force, 10 percent in the Army, and 4 percent in the Marine Corps. This high incidence of receipt may in part be due to the prevalence of sea pay. However, it is important to note that while the incidence of

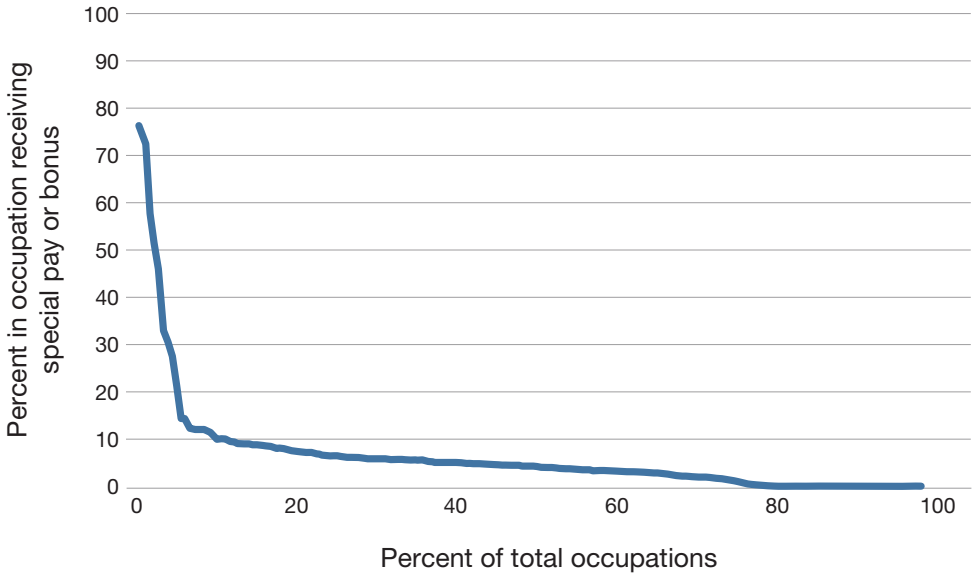
FIGURE G.1

Department of the Air Force Enlisted Incidence of Special and Incentive Pays



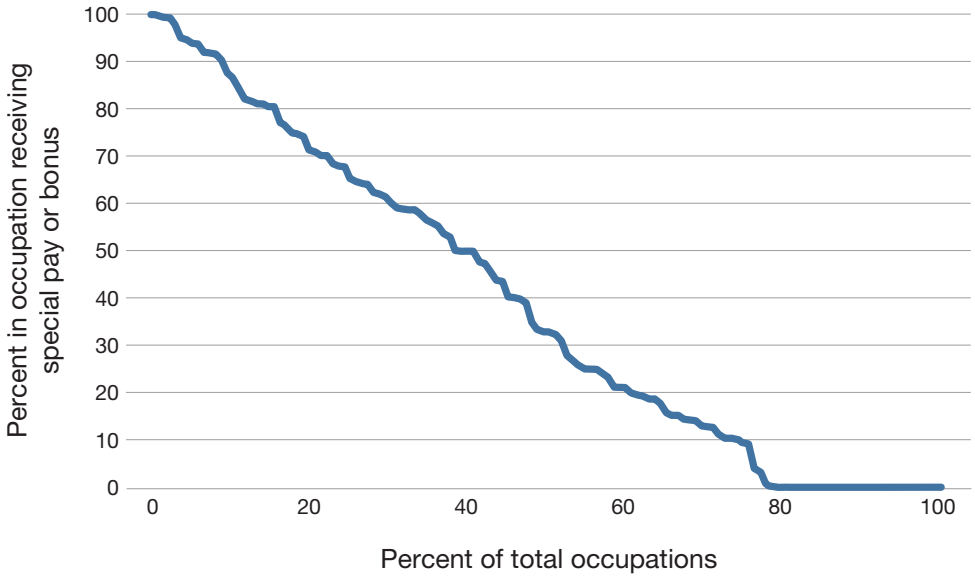
SOURCE: Author's calculations based on DMDC pay data for enlisted members in 2021.

FIGURE G.2
Marine Corps Enlisted Incidence of Special and Incentive Pays



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

FIGURE G.3
Navy Enlisted Incidence of Special and Incentive Pays



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

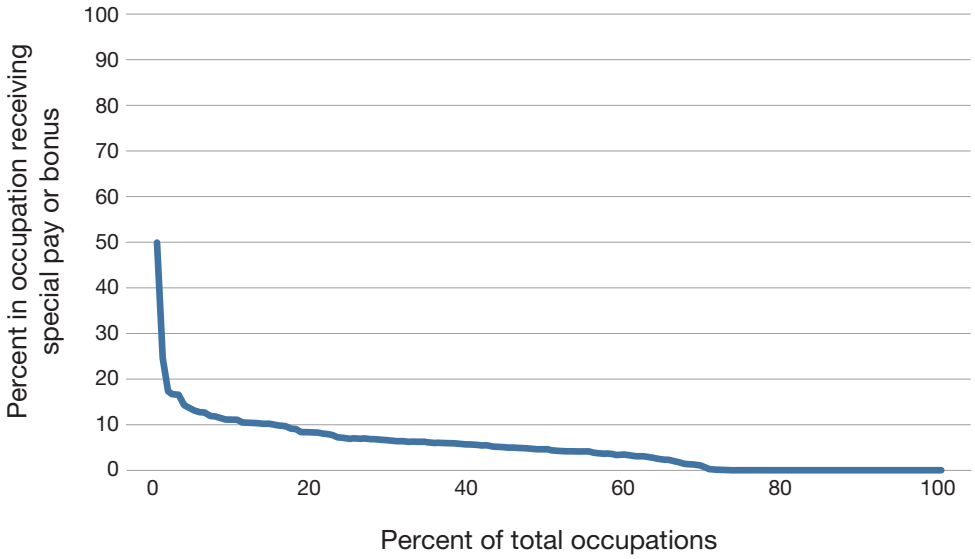
special pay and bonuses may be less skewed within the Navy, we will see later that the size of special pay and bonuses within the Navy (measured as a fraction of total compensation) can still show skewness. That is, as we will see, relatively few occupations receive a larger proportion of their compensation in the form of special pay or bonuses, while many occupations will have special pay and bonuses accounting only for a small proportion of their compensation.

Officer Incidence of Special Pays and Bonuses

We see a similar concentration of the incidence of special pays and bonuses among commissioned officers. Figures G.4–G.6 show the incidence of receipt of special pay or bonuses among officers in the Department of the Air Force, Marine Corps, and Navy, respectively. The results are similar to those seen for enlisted members, with the Army, Department of the Air Force, and Marine Corps more highly skewed than then Navy, likely due to the receipt of sea pay by naval officers.

FIGURE G.4

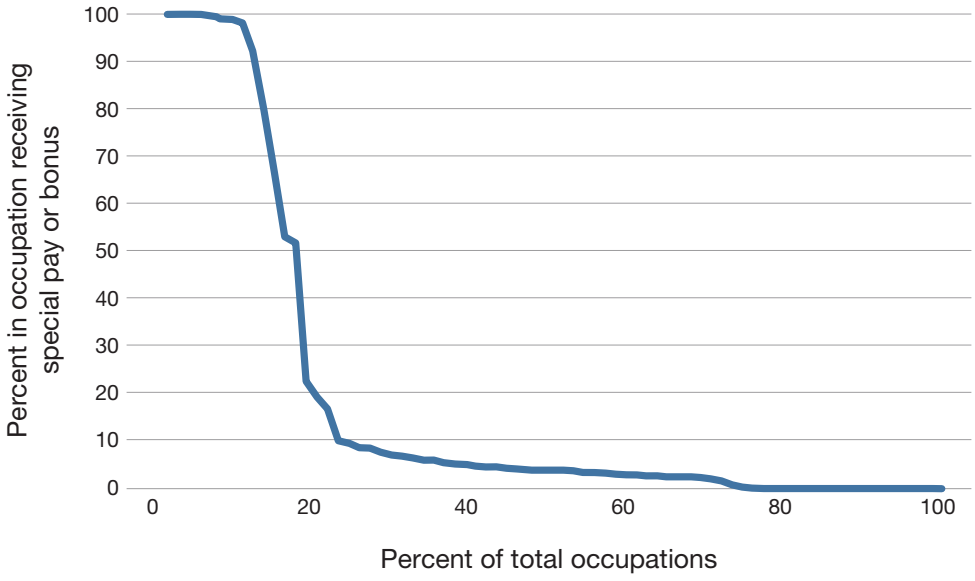
Department of the Air Force Officer Incidence of Special and Incentive Pays



SOURCE: Authors' calculations based on DMDC pay data for officers in 2021.

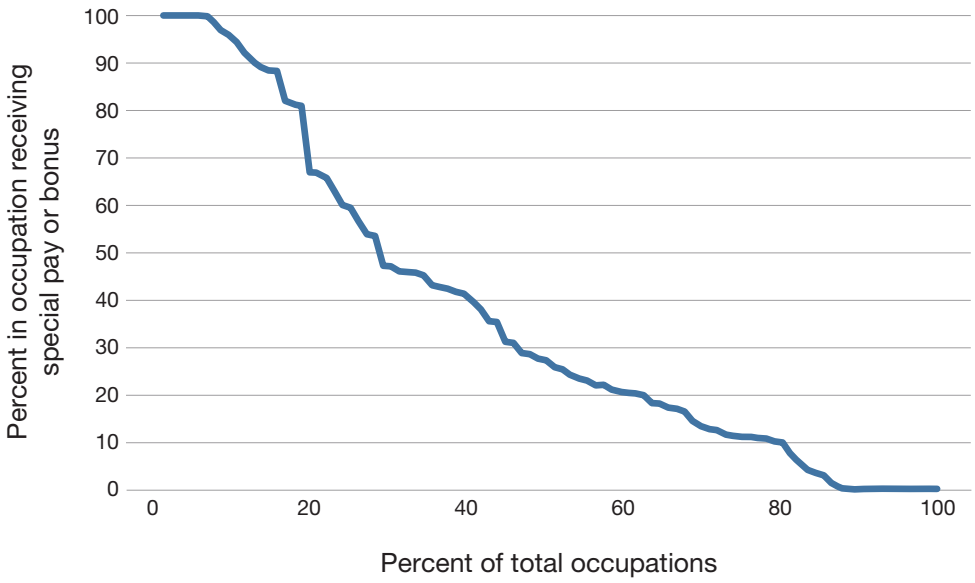
FIGURE G.5

Marine Corps Officer Incidence of Special and Incentive Pays



SOURCE: Authors' calculations based on DMDC pay data for officers in 2021.

FIGURE G.6
Navy Officer Incidence of Special and Incentive Pays



SOURCE: Authors' calculations based on DMDC pay data for officers in 2021.

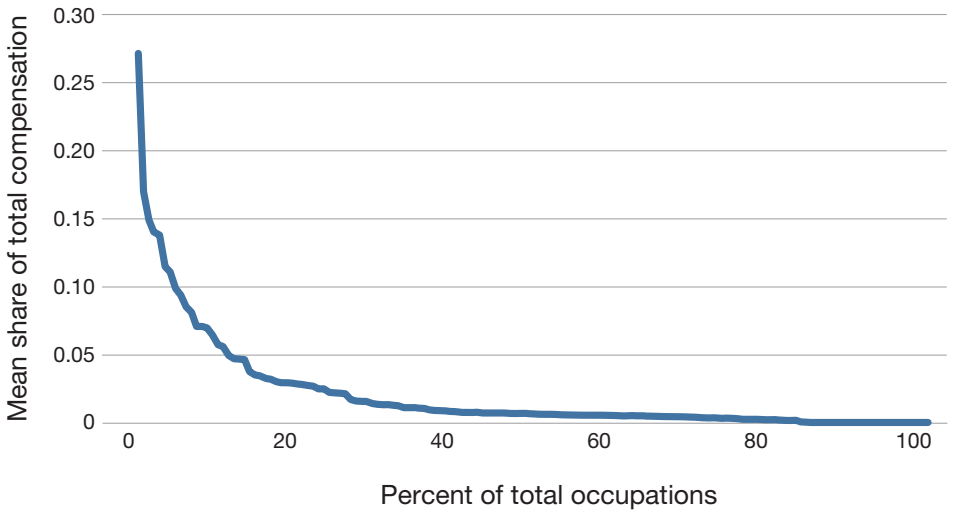
Special Pay and Bonuses as a Fraction of Overall Cash Pay

In addition to the incidence of special pays and bonuses by occupation, the size is also important. We measure the size relative to total compensation. That is, for each individual within an occupation we calculate the share of total compensation due to special pays and bonuses, and then we average across all individuals within an occupation to calculate the unconditional mean share of total compensation accounted for by special pays or bonuses. As may be recalled from Chapter 7, to create the figures we sort the occupations by shares from high to low, and then plot by occupation.

Figures G.7–G.9 show graphs of the unconditional share of total compensation for enlisted members in the Department of the Air Force, Marine Corps, and Navy, respectively. All graphs tend to be skewed, including the Navy, showing that special pays or bonuses are concentrated in a relatively few critical occupations. As we saw in Chapter 7, less than 4 percent of Army enlisted occupations are associated with special pays or bonuses that account for 10 percent or more of total compensation. The figure is less than 5 percent for the Department of the Air Force, 4 percent for the Marine Corps, and 10 percent for the Navy.

FIGURE G.7

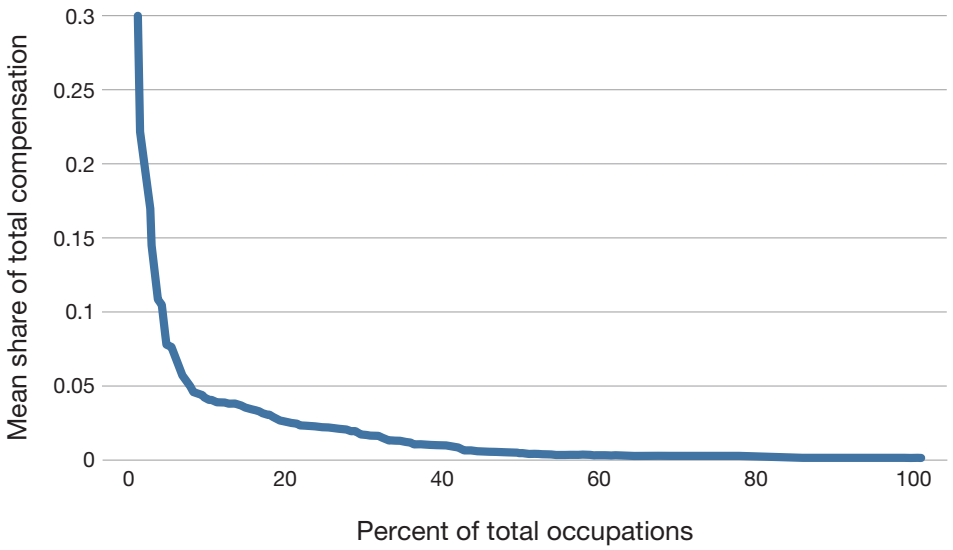
Department of the Air Force Enlisted Share of Total Compensation



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

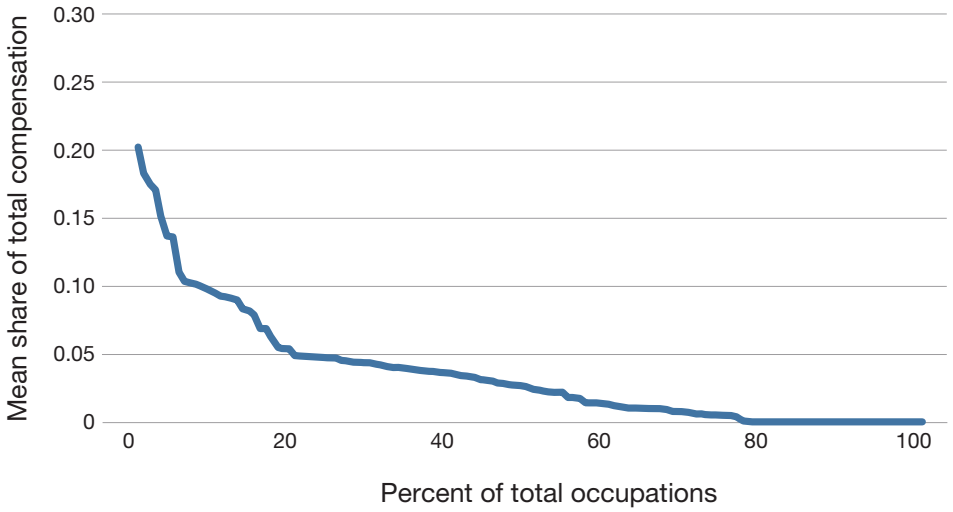
FIGURE G.8

Marine Corps Enlisted Share of Total Compensation



SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

FIGURE G.9
Navy Enlisted Share of Total Compensation

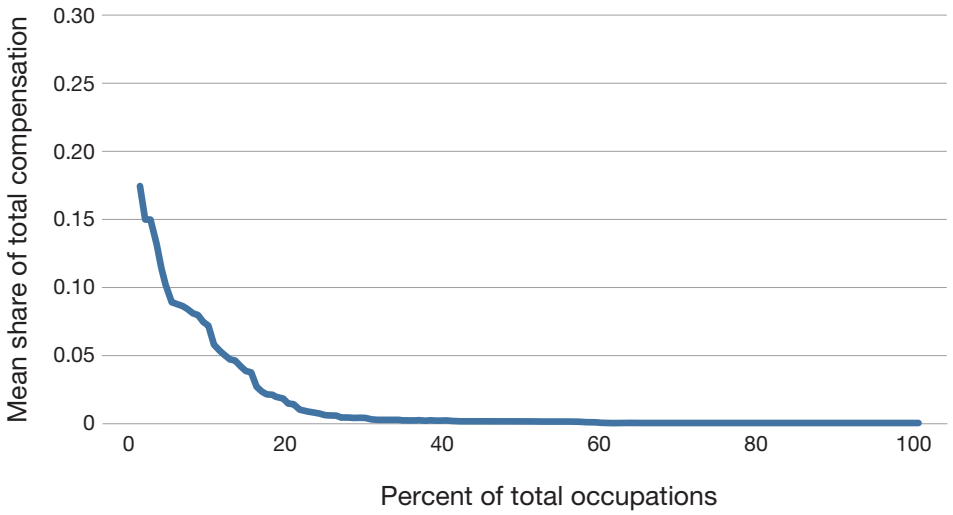


SOURCE: Authors' calculations based on DMDC pay data for enlisted members in 2021.

Officer Special and Incentive Pay and Bonuses as a Fraction of Overall Cash Pay

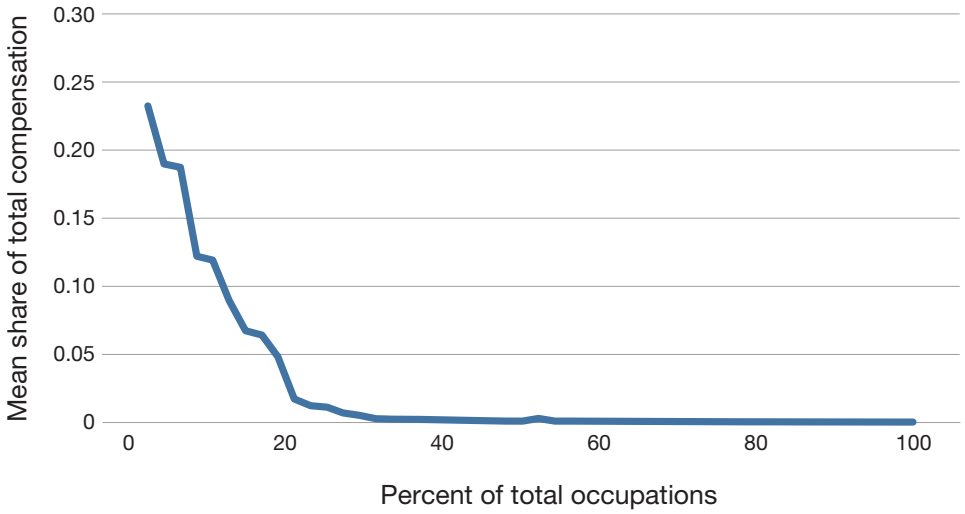
Figures G.10–G.12 show graphs of the unconditional share of total compensation for officers in the Department of the Air Force, Marine Corps, and Navy, respectively. Like the graphs for enlisted members, these figures tend to be skewed to the left, including Figure G.12, the Navy, showing that special pays or bonuses are concentrated in a relatively few critical occupations. Recall from Chapter 7 that less than 5 percent of Army officer occupations have special pays or bonuses that account for 10 percent or more of total compensation. This figure is less than 4 percent for the Department of the Air Force, 10 percent for the Marine Corps, and 6 percent for the Navy.

FIGURE G.10
Department of the Air Force Officer Share of Total Compensation



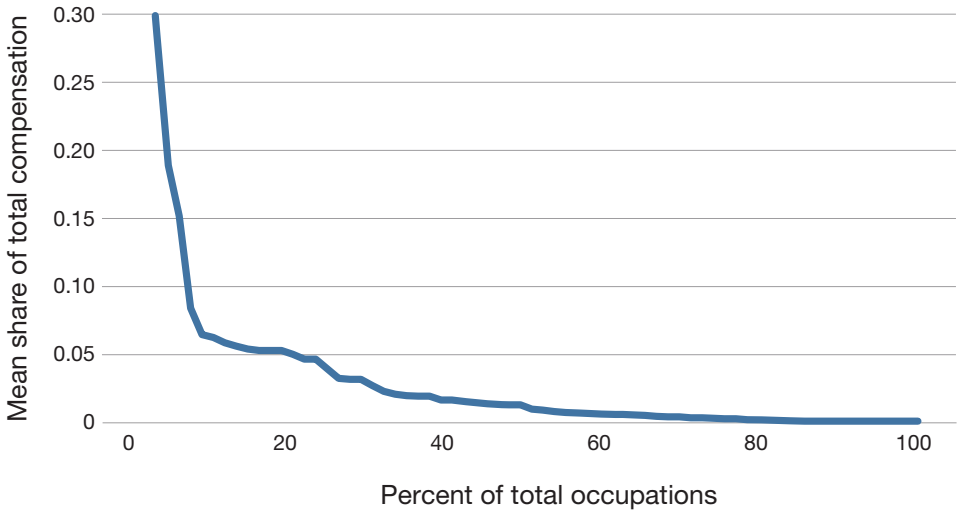
SOURCE: Authors' calculations based on DMDC pay data for officers in 2021.

FIGURE G.11
Marine Corps Officer Share of Total Compensation



SOURCE: Authors' calculations based on DMDC pay data for officers in 2021.

FIGURE G.12
Navy Officer Share of Total Compensation



SOURCE: Authors' calculations based on DMDC pay data for officer members in 2021.

Regression Analysis for Determining Extent to Which Pay Is Higher in Critical Specialties

Tables G.1 and G.2 show the regression coefficients used to construct the figures shown in Chapter 7 pertaining to the extent to which pay is higher in critical specialties.

TABLE G.1
Summary Regression Results for Enlisted Members

	Coefficient	Standard Error	*t*
Army Enlisted Members			
1. received_bonus	7,883.74	10.75	733.60
1. received_special_pay	270.55	2.60	104.20
critical_skill_flag#received_bonus	1,778.11	17.65	100.74
critical_skill_flag#received_special_pay	29.03	4.37	6.64
Navy Enlisted Members			
1. received_bonus	7,489.02	9.50	788.36
1. received_special_pay	480.55	2.52	190.82
critical_skill_flag#received_bonus	1,404.00	30.04	46.73
critical_skill_flag#received_special_pay	–43.17	6.65	–6.49
Department of the Air Force Enlisted Members			
1. received_bonus	11,076.05	14.56	760.67
1. received_special_pay	255.60	3.21	79.53
critical_skill_flag#received_bonus	1,254.87	33.06	37.96
critical_skill_flag#received_special_pay	148.50	7.36	20.18
Marine Corps Enlisted Members			
1. received_bonus	9,988.42	25.08	398.30
1. received_special_pay	–59.36	6.05	–9.82
critical_skill_flag#received_bonus	1,081.72	45.06	24.01
critical_skill_flag#received_special_pay	192.25	9.00	21.37

SOURCE: Authors' calculations and DMDC pay file data 2016–2021.

NOTE: Key coefficients reported for brevity. Full regression specification included grades, YOS, critical skill flag, and grade and YOS interacted with critical skill flag.

TABLE G.2
Summary Regression Results for Officers

	Coefficient	Standard Error	*t*
Army Officers			
1. received_bonus	37,313.58	90.75	411.16
1. received_special_pay	309.78	7.37	42.04
critical_skill_flag#received_bonus	2,434.01	153.32	15.87
critical_skill_flag#received_special_pay	227.66	12.55	18.15
Navy Officers			
1. received_bonus	9,517.18	34.25	277.87
1. received_special_pay	995.92	13.07	76.21
critical_skill_flag#received_bonus	44,402.67	191.09	232.36
critical_skill_flag#received_special_pay	–370.28	22.61	–16.37
Department of the Air Force Officers			
1. received_bonus	33,640.95	147.19	228.56
1. received_special_pay	504.58	16.58	30.44
critical_skill_flag#received_bonus	2,677.38	199.44	13.42
critical_skill_flag#received_special_pay	109.02	20.53	5.31
Marines Officers			
1. received_bonus	2,432.06	244.48	9.95
1. received_special_pay	351.66	13.28	26.48
critical_skill_flag#received_bonus	20,606.41	249.82	82.49
critical_skill_flag#received_special_pay	180.28	21.06	8.56

SOURCE: Authors' calculations and DMDC pay file data 2016–2021.

NOTE: Key coefficients reported for brevity. Full regression specification included grades, YOS, critical skill flag, and grade and YOS interacted with critical skill flag.

Abbreviations

7th QRMC	Seventh Quadrennial Review of Military Compensation
9th QRMC	Ninth Quadrennial Review of Military Compensation
10th QRMC	Tenth Quadrennial Review of Military Compensation
13th QRMC	Thirteenth Quadrennial Review of Military Compensation
14th QRMC	Fourteenth Quadrennial Review of Military Compensation
AA	associate of arts
ACIP	Aviation Career Incentive Pay
ADMF	Active Duty Master File
AFQT	Armed Forces Qualification Test
ASEC	Annual Social and Economic Supplement
AvB	Aviation Bonus
AVF	All-Volunteer Force
AvIP	Aviation Incentive Pay
BA	bachelor of arts
BAH	basic allowance for housing
BAS	basic allowance for subsistence
BLS	Bureau of Labor Statistics
CBO	Congressional Budget Office
COVID-19	coronavirus disease 2019
CPI	Consumer Price Index
CPI-U	Consumer Price Index for All Urban Consumers
CPS	Current Population Survey
DECI	Defense Employment Cost Index
DMDC	Defense Manpower Data Center
DoD	Department of Defense
DPV	discounted present value
DRM	Dynamic Retention Model
ECI	Employment Cost Index
ES-I	Executive Schedule I
ES-II	Executive Schedule II
ETP	employment-to-population
FPL	federal poverty line
FY	fiscal year
HAC	House Appropriations Committee
IPUMS	Integrated Public Use Microdata Series
LFP	labor force participation
NDAA	National Defense Authorization Act
NDRI	RAND National Defense Research Institute

OPA	Office of People Analytics
OSD	Office of the Secretary of Defense
OUSD(P&R)	Office of the Under Secretary of Defense for Personnel and Readiness
PopRep	*Population Representation in the Military Service*
PUMA	Public Use Microdata Area
Q1	first quarter
Q2	second quarter
Q3	third quarter
QRMC	Quadrennial Review of Military Compensation
RMC	regular military compensation
S&I	special and incentive
SD	standard deviation
SME	subject-matter expert
SOFS	Status of Forces Survey
SOFS-A	Status of Forces Survey of Active Duty Members
SRB	Selective Reenlistment Bonus
YOS	years of service

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NATIONAL SECURITY RESEARCH DIVISION

Rapid increases in inflation since 2020, a strong labor market, together with military recruiting struggles and reported food insecurity among military members, have put a spotlight on military compensation and on the foundational element of the compensation system, military basic pay. The National Defense Authorization Act for 2023 mandated a study of military basic pay, as does the charter of the 14th Quadrennial Review of Military Compensation, the White House–directed commission that studies military compensation. The Fourteenth Quadrennial Review of Military Compensation requested the RAND National Defense Research Institute to conduct such a study.

In this report, the authors assess the basic pay tables of junior, midcareer, and senior enlisted personnel and commissioned officers; evaluate the Employment Cost Index (ECI) as a guide to the annual pay raise, as well as alternatives; compare military pay, measured by regular military compensation, with civilian earnings and evaluate the 70th percentile benchmark developed by the Ninth Quadrennial Review of Military Compensation in 2002; and assess pay for service members in critical specialties and whether and how basic pay could be used to address personnel needs in these specialties.

The authors also review recent trends in the civilian labor market that might affect recruiting and retention outcomes and the adequacy of military basic pay; develop proposals for change, drawing from past studies and commissions that have assessed military compensation; present findings from discussions with subject-matter experts and a review of relevant academic literature; and analyze pay, personnel, and civilian labor market data.

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