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Thrift Savings Plan Contributions under the Blended Retirement System

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Abstract

The Blended Retirement System aims to increase Servicemembers' retirement savings by matching contributions to Thrift Savings Plans by up to five percent of basic pay. This new system applies to Servicemembers who entered uniformed service on January 1, 2018, or later, or to Servicemembers with early entry dates and fewer than 12 years of service who opted in to the new system during 2018. This report analyzes Thrift Savings Plan contributions by Active component Servicemembers, across Services, eligibility categories, and Servicemember characteristics. We find that age, regular military compensation, paygrade, race, and gender are all correlated to varying degrees with retirement savings rates. In particular, older and higher income Servicemembers save at higher rates. We also find substantial differences across Services in the savings patterns of auto-enrollees, suggesting differences in training or messaging. Furthermore, some Servicemembers may be saving inefficiently by reaching the annual limit on TSP contributions prior to December and thereby forgoing matching funds.

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Cover image credit: Col Darren Halford, 9th Operations Group commander (left), presents CMSgt James Crites, 9th Operations Group superintendent, his shadow box during Crites' retirement ceremony at Beale Air Force Base, CA, Jan. 9, 2015. Crites served more than 30 years in the Air Force. (US Air Force photo by Senior Airman Bobby Cummings/Released)

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Executive Summary

The Blended Retirement System (BRS), implemented in 2018, aims to make Servicemembers more active participants in retirement saving. It does so by lowering the pension payments automatically available to Servicemembers upon completing 20 years of service (YOS) and instead automatically contributing an amount equal to one percent of the member's basic pay to the member's retirement savings account and by matching the member's voluntary contributions to that retirement savings account. This allows Servicemembers to retain their retirement savings if they leave before qualifying for a pension, but means that career Servicemembers who do not proactively save for retirement will be worse off than under the previous system. This report examines how Servicemembers save for retirement and the characteristics associated with higher retirement contributions as a first step in determining whether these contributions are offsetting the reduction in pension payments.

Prior to the BRS, the Department of Defense (DOD) used a cliff-vesting pension program. Servicemembers became vested in the program (i.e., eligible for pension payments) only after 20 years of service (YOS), and received no pension benefit if they left the military prior to 20 YOS. The BRS instead provides benefits that Servicemembers may access even if they do not reach 20 YOS, while encouraging them to actively participate in their retirement planning. The BRS reduces the payment associated with the cliff-vesting program, but it compensates for the reduction by incentivizing participation in the Thrift Savings Plan (TSP), a retirement savings plan that vests member and matching contributions immediately and that vests automatic contributions after two years of service. It does so by matching Servicemembers' contributions at a 100 percent rate up to 3 percent of basic pay and at a 50 percent rate between three and five percent of basic pay. BRS participants also receive an automatic contribution equal to 1 percent of their basic pay regardless of their contribution rate; thus, the government will contribute between 1 percent (for Servicemembers who make no contribution) and 5 percent (for Servicemembers who contribute at least 5 percent) of a Servicemember's basic pay. Servicemembers who are ineligible for the BRS or who opt to remain in the legacy pension system still may contribute to the TSP, but they do not receive any matching funds or automatic contributions.

The BRS was implemented on January 1, 2018; TSP contributions prior to this date did not receive matching funds, regardless of a Servicemember's eventual BRS enrollment status. Servicemembers with Dates of Initial Entry into Military Service (DIEMS dates) or Dates of Initial Entry into Uniformed Service (DIEUS dates) on or after January 1, 2018 were automatically enrolled in the BRS, though they will receive matching benefits only after two

YOS. Those with DIEMS/DIEUS dates prior to January 1, 2018 could opt in to the BRS at any point in 2018 if they had fewer than 12 YOS, but they became ineligible upon reaching 12 YOS. Servicemembers who opted in to the BRS began receiving matching funds immediately, regardless of their YOS at the time of opt-in. Servicemembers who failed to opt in by the end of 2018 became ineligible for the BRS at the beginning of 2019.

This report examines how TSP contributions vary by Service, eligibility category, and Servicemember characteristics, using aggregate-level data provided by the Defense Manpower Data Center (DMDC) (for the Marine Corps) and TSP data (for the Army, Navy, and Air Force). We used different datasets because only the Marine Corps provided usable TSP data to DMDC in 2018. Each dataset has strengths and weaknesses—DMDC data let us observe Servicemembers' characteristics but did not show whether they had an active TSP account or had opted in to the BRS (if eligible), whereas TSP provided data on only Servicemembers enrolled in the BRS. We examined how the Marine Corps' contribution patterns varied prior to and during BRS implementation, along with how Marines who were ineligible for the BRS may have been affected during this process, but we could not determine whether contribution rates among eligible Marines changed because they planned to opt in to the BRS or because they were better informed about retirement savings more generally. Conversely, we could clearly view behavior by Soldiers, Sailors, and Airmen who opted in to the BRS, but we had a far more limited set of characteristics by which to evaluate them and could not observe how their behavior changed prior to or immediately upon opting in.

Our principal findings include the following:

- Auto-enrolled Servicemembers from all four Services are more likely than those who opted in to contribute the default rate of 3 percent.

- Soldiers and Airmen were much more likely than Sailors or Marines to make the default TSP contribution of three percent of basic pay, likely reflecting Service-level differences in BRS implementation.

- Both BRS-eligible and BRS-ineligible Marines became much more likely to contribute to the TSP in the May 2017 pay data, likely reflecting both Corps-wide education on the BRS and positive spillover effects.

- Age, regular military compensation (RMC), and paygrades (both enlisted and officer) exhibited clear correlations with contribution levels, as predicted by research on civilian retirement saving.

- Some Servicemembers may be contributing to the TSP at too high a rate and forgoing matching funds by reaching the elective deferral limit prior to December. This issue can likely be addressed at low cost to the Services.

Contents

Introduction

The Blended Retirement System (BRS), implemented in January 2018, aims to make Servicemembers more active participants in retirement saving. It does so by lowering the pension payments automatically available to Servicemembers upon completing 20 years of service (YOS) and instead automatically contributing an amount equal to one percent of the member's basic pay to that member's Thrift Savings Plan (TSP) account and matching a portion of voluntary contributions to the TSP. Servicemembers who exit the uniformed services prior to 20 YOS will retain their TSP contributions, but BRS participants who do not proactively save for retirement will receive lower pension payments without sufficient TSP savings to offset the difference.

Servicemembers entering after January 1, 2018, are automatically enrolled in the BRS. Those who entered before this date could opt in to the BRS at any point in 2018, provided they had not completed 12 YOS before choosing to opt in. Eligible Servicemembers who did not opt in to the BRS remained in the legacy system and became BRS-ineligible on January 1, 2019. Considering that some Servicemembers had a choice to enroll in the BRS and some did not, this study has three main objectives:

1. Describe the contribution patterns of opt-in BRS participants.
2. Describe the contribution patterns of auto-enrolled BRS participants.
3. Identify differences in contribution rates by Service, paygrade, gender, and other relevant factors.

We used data from the Defense Manpower Data Center (DMDC) pay records and the TSP Office. The DMDC data contain information for only the Marine Corps on Servicemember eligibility for the BRS, those auto-enrolled, and contribution percentages. The data also contain information on Servicemember paygrade, age, regular military compensation (RMC) level, gender, race, and Hispanic ethnicity. Using this information, we examined Marine Corps TSP contribution rates by various demographic and socioeconomic characteristics.

The TSP Office provided data on Soldiers, Sailors, and Airmen; however, these data do not contain as much demographic information as those from DMDC. Using the TSP Office data, we examined contribution patterns among auto-enrollees and among Servicemembers who opted in to the BRS. However, we did not have data on Soldiers, Sailors, or Airmen who remained in the legacy retirement system or data from prior to any Servicemember's BRS enrollment.

Furthermore, we could examine differences in participation and contribution patterns only by age and basic pay.

The rest of the paper is organized as follows. We start by providing background information about the BRS, previous studies on the BRS, and the literature on civilian retirement plans that are relevant to this study. Then, we show participation and contribution patterns of opt-in and auto-enrolled participants. As part of this analysis, we emphasize overall Service-level differences over time; differences between older. Finally, we conclude with a discussion of the implications of our results and how they relate to the single-salary system.

Background

The fiscal year (FY) 2013 National Defense Authorization Act (NDAA) established the Military Compensation and Retirement Modernization Commission (MCRMC) to review and make recommendations regarding compensation and retirement reform in the military [2]. The commission was established in response to concerns over the legacy retirement system, which provides a defined benefit plan that is vested upon 20 YOS. According to some, this system is inflexible as a force-shaping tool because of its one-size-fits-all nature. It is inefficient because Servicemembers generally are younger and place a higher value on current rather than deferred income. And finally, it is inequitable because most officers and enlisted personnel do not meet the vesting cliff of 20 YOS [3].

Responding to these concerns, the goals for a new retirement system were to maintain the current force structure, reduce personnel costs, and provide some retirement benefits to Servicemembers leaving before 20 YOS [4-5]. The final MCRMC report, released in January 2015, provided several recommendations intended to accomplish these goals [6]. Based on these recommendations, the FY 2016 NDAA established the BRS, to be implemented in January 2018 [7]. Before we discuss the changes to the retirement system in more detail, we describe BRS eligibility requirements.

BRS eligibility

BRS eligibility is determined by date of entry[1] into the Uniformed Services and YOS. Servicemembers entering on or after January 1, 2018, are automatically enrolled in the BRS and do not participate in the legacy system. Active component (AC) personnel with less than 12 YOS who entered before January 1, 2018 were eligible to opt in to the BRS between January 1, 2018, and December 31, 2018. Those who did not opt in remained in the legacy system. Those with 12 or more YOS were ineligible to enroll in the BRS and remained under the legacy system. Figure 1 shows the different paths to the BRS and the legacy system depending on the date of entry and YOS. Essentially, this results in four groups of interest: BRS auto-enrolled participants, BRS opt-in participants, legacy system stayers, and Servicemembers ineligible for the BRS.

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[1] This is the date of initial entry to military service (DIEMS) or the date of initial entry to uniformed services (DIEUS).

Figure 1.   Retirement system eligibility
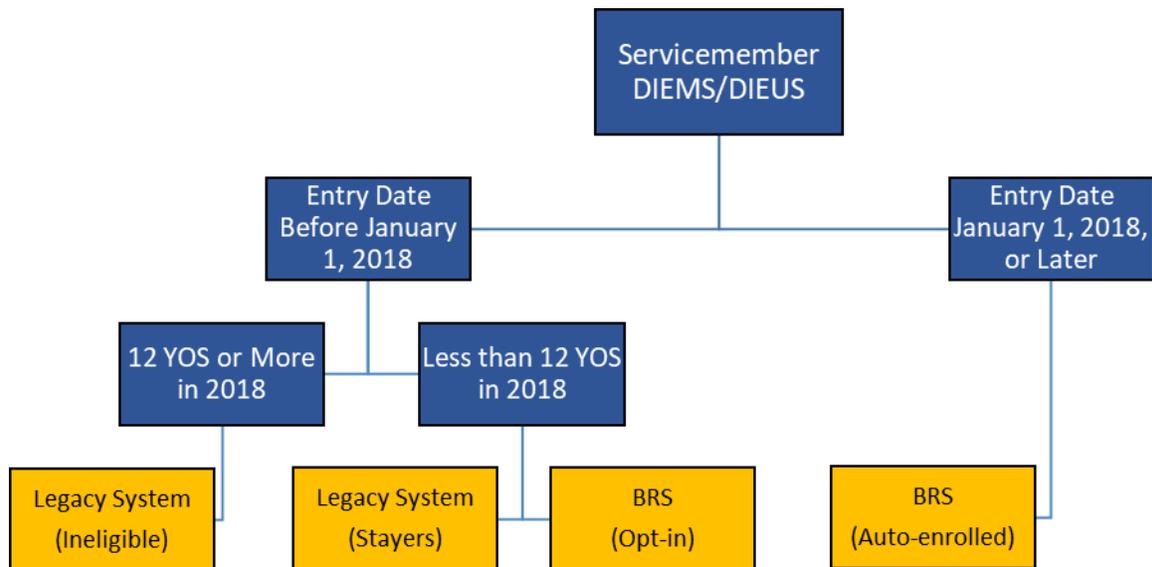
Source: CNA generated.
Note: DIEMS—Date of Initial Entry to Military Service. DIEUS—Date of Initial Entry to Uniformed Services. Servicemembers entering before January 1, 2018 with less than 12 YOS were grandfathered into the legacy system, but could choose to opt in to the BRS in 2018.

Elements of the BRS

The BRS instituted the following four main changes to the military retirement system [7]:[2]

- The establishment of Department of Defense (DOD) automatic and matching contributions to a thrift savings plan (TSP)[3]
- The reduction of the defined benefit plan monthly annuity payment multiplier
- The establishment of continuation pay at 12 YOS[4]
- The establishment of a lump-sum retirement option

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[2] The Office of Financial Readiness provides a succinct guide to these four BRS elements [8].

[3] TSP has existed since 1986 as a federal program available to civilian employees. In FY2001, the Floyd D. Spence National Defense Authorization Act extended the TSP to military personnel. In general, Servicemembers did not receive matching contributions until the establishment of the BRS [9].

[4] This has since been updated; Servicemembers are now able to receive continuation pay any time between 8 and 12 YOS, though Services may determine the timing and amount.

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This paper focuses on the TSP component of the BRS; however, Servicemembers make decisions regarding TSP based on the entire military retirement package. Therefore, we describe each aspect of the BRS system in more detail.

TSP defined contribution plan

TSP is a defined contribution plan, which means its retirement value depends on the contributions of the employer and employee and on market performance after contributions have been made. Once a TSP account has been set up for a Servicemember, which typically takes 60 days from application, an automatic contribution of 1 percent of basic pay is made from the Services, regardless of what the Servicemember contributes. Servicemembers are allowed to make additional contributions within the limits set by the Internal Revenue Service.[5] In addition, the Services will match up to 4 percent of basic pay if a Servicemember contributes 5 percent of basic pay (see Table 1 for more details). Servicemembers opting in to the BRS choose initial contribution rates. Servicemembers automatically enrolled are started at 3 percent, although they can adjust this amount at any time. Servicemembers who opt in to the BRS receive Service matching contributions immediately, regardless of YOS. For auto-enrolled Servicemembers, matching starts after 2 YOS.

Table 1.   BRS Servicemember contribution and Service matching contributions

Servicemember Contribution	Service Automatic (1%) Contribution	Service Matching Contribution	Total Contribution
0.0%	1.0%	0.0%	1.0%
1.0%	1.0%	1.0%	3.0%
2.0%	1.0%	2.0%	5.0%
3.0%	1.0%	3.0%	7.0%
4.0%	1.0%	3.5%	8.5%
5.0%	1.0%	4.0%	10.0%
>5.0%	1.0%	4.0%	>10.0%

The TSP allows Servicemembers to receive some retirement benefits if they serve fewer than 20 years. In contrast, the legacy retirement system provided a defined benefit plan that became vested only after 20 or more YOS. In other words, if a Servicemember did not serve 20 or more years, he or she received no retirement benefit from the military. With TSP, Servicemembers

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[5] Contribution limits change over time, but in 2018 the limit on Servicemember contributions to TSP was $18,500. This does not include Service matching contributions. The total cap on Servicemember contributions and Service matching contributions was $55,000 in 2018. Individuals 50 years old or older can make catch-up contributions up to $6,000.

become vested (have ownership) of the Service's automatic 1 percent contribution after two YOS. Servicemembers always are vested in their own contributions and their earnings. Servicemembers are immediately vested in Service matching contributions and their earnings.

Servicemembers who do not participate in BRS, either because they are ineligible or because they opted to stay with the legacy system, may still contribute to the TSP. They will not receive Service matching contributions, but will still receive all tax advantages that come with retirement savings accounts.

Defined contributions

Both the legacy system and the BRS have a defined benefit component. The difference is that under the BRS, the defined benefit multiplier was changed from 2.5 percent to 2.0 percent. The formula for calculating the monthly pension payment for life is 2.0 percent × years served × average of highest 36 months of basic pay. This implies that the longer the service, the higher the monthly pension payment. Payments are adjusted for cost of living over time.

Continuation pay

Under the BRS, AC Servicemembers between 8 and 12 YOS are eligible for continuation pay (CP), which is a one-time bonus of between 2.5 to 13 times regular pay in exchange for 3 or more years of additional service [8]. Currently, all Services set the timing of CP for AC personnel to 12 YOS with a multiplier of 2.5 and an additional commitment of 4 years of service [10]. However, Services may adjust the timing, multiplier, or additional commitment within the bounds mentioned above. CP adds flexibility and is an adjustable lever for the Services to affect retention. Under the BRS, CP offsets potential declines in retention due to the decreased defined benefit multiplier. Servicemembers may contribute CP to the TSP.

Lump-sum retirement option

Finally, between the age of military retirement and the age of Social Security retirement, Servicemembers may elect to receive a portion of their future retirement payments in a discounted lump sum paid at the time of retirement from military service. Servicemembers can choose to receive 25 or 50 percent of future payments. This implies that the monthly retirement pay until Social Security retirement age will be 75 or 50 percent of the full monthly value if the lump-sum option is chosen. Once a person reaches full Social Security age, which is usually 67, the payments will revert to their full value. The lump-sum option is available at retirement upon 20 or more YOS, and Servicemembers must make the lump-sum election no less than 90 days before retirement.

Literature Review

We divide the literature review into two sections. The first examines studies conducted before BRS implementation that either discuss or simulate the possible effects of BRS on force structure, retention, and personnel costs. The second reviews papers on civilian retirement plans, including enrollment rates, employer match rates, and employee contribution rates. Private-sector defined contribution plans are comparable to TSP and can inform the analysis in this report.

BRS literature

We begin the BRS literature review by discussing the analysis that laid the groundwork for MCRMC's BRS plan and the subsequent analysis of the potential implications of BRS. These studies do not analyze Servicemember behavior under BRS; rather, they use simulation or other methods to infer how BRS may affect Servicemember behavior and DOD personnel costs. We close with a discussion of a paper that analyzes actual Servicemember behavior under BRS.

Simulation papers and discussion papers

In 2011, the Office of the Secretary of Defense convened a DOD working group to review military compensation. Between 2011 and 2013, RAND provided analytic support to this group as it considered two concepts. Asch et al. (2014) use RAND's dynamic retention model (DRM) to evaluate the effects of a hybrid retirement plan that combines a reduced defined benefit with a defined contribution plan and continuation pay. They find that the blended approach can maintain the current force structure while decreasing personnel costs and increasing flexibility in using the system as a retention tool [16].

The DOD working group developed two concepts that were given to MCRMC, and the MCRMC BRS plan was, in part, based on the working group concepts. Evaluating the MCRMC plan, Asch et al. (2015) use RAND's DRM to find that the BRS plan could maintain force structure while decreasing cost, adding flexibility, and being valuable to Servicemembers because of early vesting in the defined contribution plan and the lump-sum option [3]. Finally, Asch et al. (2017) use the DRM to further analyze the BRS with a focus on retention and cost effects, as well as add a Coast Guard analysis.[6] They find that the enlisted CP multiplier can be set at or

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[6] See Asch et al. (2019) for a detailed analysis of the effects of BRS on the Army Reserve [17].

near the floor of 2.5 to achieve baseline retention, but the officer continuation pay multiplier would have to be higher.

Grefer and coauthors also produced several analyses of BRS. The first study, Grefer (2016), examines the potential effects of the MCRMC's BRS plan assumptions on recruitment, retention, and personnel costs in the Navy and Marine Corps [5]. He concludes that young enlisted recruits may prefer the new system, but officers may prefer the old system if they perceive TSP to be a series of short-term investments. To maintain the current length of service profiles (LOS) for both enlisted and officers, he suggests that the Services will need to pay higher CP than the MCRMC estimate of 2.5 times basic pay. This implies higher personnel costs than the commission estimated.

The second and third studies evaluate the effects of MCRMC's BRS plan on the Marine Corps' force management objectives (FMOs). Both studies find that the effects of BRS on the Marine Corps' FMOs change based on the underlying assumptions of MCRMC's BRS plan, including assumptions about personnel discount rates, CP amounts, average DOD contributions to TSP, and opt-in rates in the first year. Grefer et al. (2016a) reason that recruitment may benefit under the new system, but if older Servicemembers have higher personal discount rates (PDRs), retention may be negatively affected [11]. They also reason that potential savings to DOD and the Services may decrease if CP needs to be increased to maintain force profiles, if BRS opt-in rates are lower than expected, or if TSP contribution rates are higher than expected.

Using simulation methods, Grefer et al. (2016b) find that YOS profiles for active component (AC) personnel are not very sensitive to changes in assumptions; however, personnel cost savings estimates for both officers and enlisted in the AC are more sensitive to assumptions [18]. Additionally, Huff et al. (2018) model the effects of CP on enlisted force profiles for the Navy [4]. They find that CP can offset decreases in retention due to the pension reduction. The lowest level they model (2.5 times monthly basic pay) is not enough to match retention levels before BRS; however, 7.5 and 12.5 are enough.

Several CNA reports focus on specific BRS aspects. Ladner and Malone (2018) show that leave percentages in some occupation groups are higher at 8 and 9 YOS, suggesting that offering CP earlier than 12 YOS may be advantageous [12]. Because of the concern that Servicemembers may choose the lump-sum option without considering its costs, Grefer and Parcell (2017) discuss treating the lump-sum option in BRS as a loan, and they developed a calculator showing the costs and benefits of the regular pension and the lump-sum option [13]. Lien (2016) focuses on the discount rate used by MCRMC and its relation to the lump-sum option and recommends that the discount rate should not vary between enlisted and officers, should be the same for the 25 and 50 percent lump-sum options, and should not encourage any particular

choice [14]. Finally, Lien and Alper (2016) discuss options for setting the lump-sum discount rate [15].

BRS analysis studies

Both the simulation studies and discussion papers use historical, pre-BRS data or theory to infer what would happen under BRS. None use information on Servicemember behavior after BRS implementation. However, Brockert (2019) examines actual BRS participation rates and TSP contribution rates in the Marine Corps [19]. He finds that about 50 percent of eligible Marines opted in to BRS by the end of 2018. Perhaps unsurprisingly, Marines with fewer YOS and younger Marines were more likely to opt in to BRS. He also finds that many Marines are not maxing out contributions to receive the full Service matching contribution.[7]

Brockert (2019) is the first study we know of that analyzes actual Servicemember behavior under BRS. We contribute to this literature by conducting an analysis across Services, and while Brockert (2019) focuses on participation, we provide an in-depth analysis of contribution patterns.

Retirement plan literature

This subsection starts by describing defined benefit and defined contribution plans in more detail. Then, we discuss reports related to the participation and contribution patterns of employees in defined contribution plans. Since the focus of this report is on TSP, which is a defined contribution plan, we restrict our attention to the literature on this subject.

Defined benefit and defined contribution plans

Defined benefit plans (pensions) offer payouts to former employees based on a predetermined formula that is usually based on salary and years of employment. This type of plan requires no employee contribution. The employer invests in the appropriate funds to make future payouts to its employees. In this way, the firm bears the majority of the risk and administrative costs. However, as recent recessions have demonstrated, pensions are not guaranteed, and payouts can be reduced if the pension fund is mismanaged by the employer or if outside forces, such as the 2008–2009 financial crash, reduce its value.

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[7] Although not a direct study of BRS, Pontiff (2018) finds that new Air Force recruits and airmen with 2 YOS have poor financial knowledge and practices, which may be a cause for concern as Servicemembers choose BRS participation and TSP contribution rates [20].

Defined contribution plans are retirement plans in which the employee, employer, or both contribute funds to a retirement account. Employee contributions come with tax advantages—either contributions are tax deductible or withdrawals are tax free. Examples of defined contribution plans include 401(k)s, 403(b)s, IRAs, and ROTH IRAs. Employees have the ability to choose their contribution rate and, to a limited extent, how the funds are invested. Employers often will match contributions up to a certain percentage of an employee's salary.

Because defined contribution plans place more decision-making power in the hands of the employee, questions have been raised about employee retirement-saving behavior. For example, should employees be automatically enrolled in a retirement plan? What if they have multiple options? How do employees respond to employer matching? How much do employees choose to contribute to their defined contribution plans? We review the literature addressing these questions in the following subsection.

In the last four decades, defined contribution plans have grown in popularity to the point that most large private employers offer only defined contribution plans and not defined benefit plans to new employees [21-23]. Although defined contribution plans became the primary vehicle for retirement savings in the private sector, the public sector lagged, although its use of defined contribution plans also increased [21].

Participation and contribution rates

Enrollment rates in employer-sponsored defined contribution plans are not 100 percent, even though these plans provide tax advantages and often employer-matched contributions. The Bureau of Labor Statistics shows that 62 percent of private industry workers in 2016 had access to defined contribution plans but only 44 percent participated [24]. Further, research finds that many employees are reluctant to join or take full advantage of attractive retirement plans—even in "for-sure profit" situations [25-26].[8]

Research shows that participation can be affected by the default option. For example, studies find that automatically enrolling employees in defined contribution plans, but giving the option to decline enrollment, increases defined contribution enrollment rates [27-28]. Further, Chingos and West (2013) show that when teachers in Florida were automatically enrolled in a defined benefit plan but given the choice to switch to a defined contribution plan, only 30 percent did [29]. This suggests that people often choose the option that requires the least

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[8] In the for-sure profit case, employees of a certain age are allowed to withdraw funds from a retirement account while working without penalty, and they receive an employer match. In effect, these employees can immediately withdraw the funds they invest while still receiving the employer match. The authors find about 36 percent of employees in these situations do not contribute enough for the full match.

effort. This research suggests that automatically enrolling Servicemembers into BRS will increase participation, but that Servicemembers eligible to switch to BRS may stay under the legacy system even when BRS should be a preferable option.

In 2016, Vanguard reported that participants in its defined contribution plans contributed 6.2 percent of their salaries on average [30]. With employer matches, the contribution rate was 10.9 percent. Studies show that, under automatic enrollment, employees are likely to keep the automatic contribution rate [27-28]. According to the Vanguard report, it is common for the default contribution rate to be set at or near 3 percent [30]. This suggests that auto-enrolled BRS participants may have a 3 percent contribution rate on average since this is the default rate.

Studies have also examined the effects of employer matching on employee participation and contributions. Huberman et al. (2007) find that employer matching increases employee contributions, especially for low-income employees [31]. However, Engelhardt and Kumar (2007) find that employer matching has small positive effects on participation and contribution, and they conclude that matching is a rather poor policy instrument to increase savings [32]. Therefore, under BRS, it is unclear whether the lower DOD match rates at Servicemember contribution rates of 4 and 5 percent will induce Servicemembers to contribute beyond the 3 percent default rate.

Finally, studies examine differences in participation and contribution patterns in defined contribution plans along several other dimensions. Huberman et al. (2007) find that participation rates and contribution rates increase with income and that women have higher participation and contribution rates than men [31]. The Vanguard report also shows that participation and contribution rates increase with age [30]. Based on these papers, we expect Servicemember characteristics to affect TSP participation and contribution rates.

Implications

The previous discussion indicates that automatic enrollment and a default contribution rate of 3 percent under BRS align with features of the private-sector retirement system. Since participants usually maintain the default settings, MCRMC's assuming a 3 percent contribution rate may be reasonable. However, Servicemembers opting in to BRS have no default contribution rate, so it is unclear what rates they would choose. Further, since research indicates that people often choose the default plan regardless of value, opt-in rates into BRS may not be as high as MCRMC anticipated. In the next section, we empirically examine enrollment rates and contribution patterns.

Overall Differences in TSP Contribution Rates

In this section, we present TSP contribution rates over 2018 for BRS auto-enrollees and opt-ins in the Army, Navy, and Air Force, and TSP contribution rates over 2017 and 2018 for auto-enrolled, BRS-eligible, and BRS-ineligible Marines. Our goal in this section is to highlight differences by Service and eligibility category.

Data comparability issues

Data on Army, Navy, and Air Force contributions came from the TSP Office and cover only Servicemembers who contributed to the TSP *under the BRS*. As a result, we cannot view TSP contributions by Servicemembers who did not participate in the BRS or that took place prior to BRS enrollment.

We present data on the Marine Corps separately form the other three Services because DMDC data do not state whether Servicemembers were enrolled in the BRS; DIEMS dates let us infer whether they were auto-enrolled in or ineligible for the BRS, but we cannot determine whether those eligible for the BRS opted in.[9] Because TSP contribution rates among BRS-eligible Marines could reflect either Marines opting into the BRS or spillover effects on those remaining in the legacy system, comparing BRS-eligible Marines to auto-enrollees and BRS-ineligible Marines may provide suggestive evidence of the extent to which either is true.

Some Servicemembers contributed amounts that seemed implausibly high or impossibly low. The TSP Office separated out contribution rates less than 0 percent or greater than 30 percent

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[9] Because the Marine Corps was the only Service that treated remaining in the legacy retirement system as an affirmative choice rather than a passive default option, we cannot assume that Marines opted into the BRS at the same rate as other Servicemembers, that the distribution of opt-in decisions across months in 2018 was identical for Marines and other Servicemembers, or that Marines who opted into the BRS were as likely as other Servicemembers to make any TSP contribution. Although eligible Marines who made TSP contributions were probably more likely than those who did not to have opted into the BRS, we cannot comment on the extent to which this is true in practice. It is possible that this framing may have forced more Marines to weigh the benefits and costs of the BRS prior to its implementation and thereby increased early opt-in rates (and the amount of time Marines would receive matching funds for a given basic pay level relative to Soldiers, Sailors, and Airmen).

and listed them under a single category as errors.[10] Because we cannot tell which types of errors are which, we chose to omit these values from our analysis. However, the Marine Corps data obtained from DMDC treated the former set of flagged values as equal to a 0 percent contribution rate and the latter as greater than 5 percent, without indicating how many such values there were. Furthermore, DMDC data may list Marines as making 0 percent TSP contributions for multiple reasons: because they are participating in the legacy retirement system and therefore do not wish to contribute to the TSP, because they are participating in BRS and wish to receive only the 1 percent automatic contribution, or because they have been auto-enrolled in BRS but do not yet have TSP accounts to contribute to. Because the last of these reasons distorts graphs of auto-enrolled Marines based on sample size, as Marines enlist or receive their commissions without providing an actionable interpretation, we omit auto-enrolled Marines making 0 percent TSP contributions. As a result, our analysis may understate how often Marines contribute 0 percent to the TSP relative to Soldiers, Sailors, or Airmen and overstate how often they contribute over 5 percent.[11]

Table 2 presents the differences of the data sources. Other than age, demographic information such as gender, and education level are only available from one source and for one Service. Additionally, the income measures differed between the two data sources, with the DMDC providing by Regular Military Compensation (RMC), and TSP data providing Basic Pay. Because RMC contains the basic allowance for housing (BAH) and basic allowance for subsistence (BAS) in addition to basic pay, it is closer to a Servicemember's total pay and may therefore be a better determinant of how much a Servicemember would be choose to contribute.

Table 2. Disparities between DMDC and TSP data sources

	DMDC Data	TSP Data
Services	Marine Corps	Army, Navy, Air Force
BRS enrollment required?	No	Yes
Can identify opt-ins?	No	Yes
Contains 2017 data?	Yes	No
Income measures	RMC	Basic Pay
Other characteristics	Paygrade, age, gender, race, Hispanic ethnicity, marital status, race x gender, education level	Age

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[10] Brockert (2019) theorizes that Marines may contribute large percentages of their basic pay while deployed; similar behavior also might exist among those in other Services.

[11] We show in Appendix A how auto-enrolled Marines' contributions patterns vary when including Marines with 0 percent contribution rates.

Army, Navy, and Air Force TSP contributions

Figure 2 shows contribution patterns by auto-enrolled Servicemembers in the Army, Navy, and Air Force in 2018. These graphs show the percentages of Soldiers, Sailors, and Airmen, respectively, contributing different amounts in each month. The 12 months of 2018 are arranged along the vertical axis, and percentages are stacked to sum to 100. Each contribution level is shaded a different color.

Three things immediately stand out. First, TSP contribution data do not exist in January 2018 for any Services and are available for all three Services only in May 2018. This is chiefly because TSP cannot report information on Servicemembers whose accounts do not yet exist, but may reflect some Service-level differences in how quickly TSP accounts were set up or how quickly these data were provided to the TSP office. May is also the first month in which a clear picture of contribution patterns begins to emerge, likely because it is the first month in which each Service provided data on over 100 Servicemembers. Second, Soldiers and Airmen default to a 3 percent contribution level far more often than Sailors. In every month since May 2018, at least 75 percent of auto-enrolled Soldiers and 67 percent of auto-enrolled Airmen contributed 3 percent; by contrast, fewer than 45 percent of Sailors contributed at this level in any month. However, while Sailors were more likely to receive all possible matching funds by contributing at least 5 percent, they also were more likely to forgo some of the matching funds available at the default contribution rate of 3 percent. Over the second half of 2018, Soldiers and Sailors gradually became less likely to contribute the default rate, and the percentage contributing over 5 percent increased. However, Airmen became more likely to contribute the default rate through September 2018, likely reflecting the fact that the sample of Airmen was both smaller and grew at a different rate than the samples of Soldiers and Sailors.

Figure 2.   Army, Navy, and Air Force TSP contribution rates, auto-enrollees, 2018
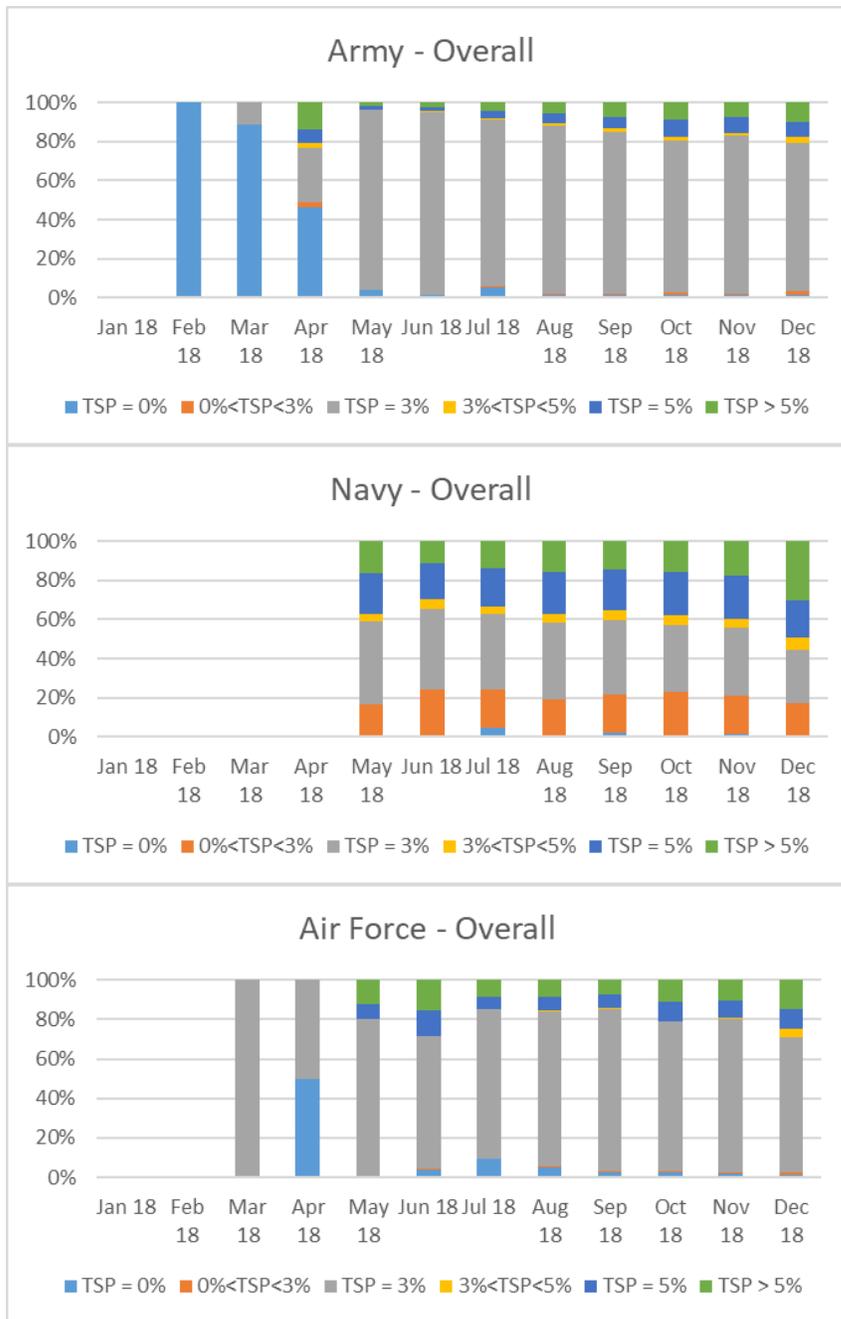
Notes: Sample sizes for Soldiers ranged from 3 (in February) to 28,629 (in December). Sample sizes for Sailors ranged from 165 (in May) to 23,568 (in December). Sample sizes for Airmen ranged from 1 (in March) to 9,526 (in December). Source: TSP.

Figure 3 shows the corresponding enrollment rates for Soldiers, Sailors, and Airmen who opted into the BRS. Samples in January 2018 were extremely low for each Service (0 Soldiers, 43 Sailors, and 1 Airman) but grew rapidly over the next two months (approximately 2,000 Soldiers and Sailors and approximately 1,500 Airmen in February; 27,457 Soldiers, 46,242 Sailors, and 29,083 Airmen in March). Over the remaining 10 months of 2018, opt-in samples grew much more steadily; as a result, contribution patterns change noticeably between January and March 2018 as the sample composition shifts but remain fairly stable afterwards.

Figure 3.   Army, Navy, and Air Force TSP contribution rates, opt-ins, 2018
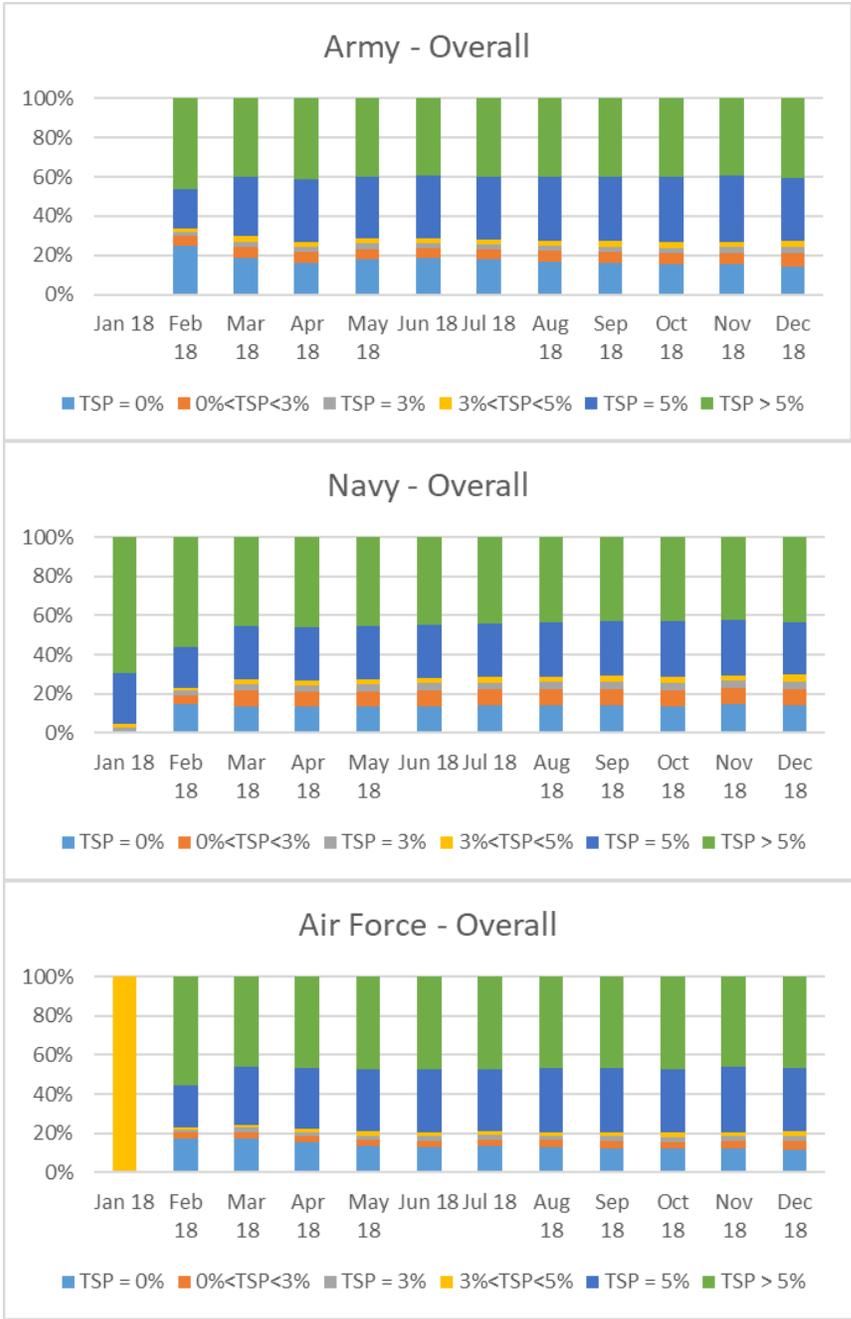
Notes: Sample sizes for Soldiers ranged from 1,983 (in February) to 54,362 (in December). Sample sizes for Sailors ranged from 43 (in January) to 121,152 (in December). Sample sizes for Airmen ranged from 1 (in January) to 50,746 (in December). Source: TSP.

As a rule, Servicemembers who opted into the BRS contributed different amounts to the TSP than those who were auto-enrolled. In any given month, auto-enrolled Sailors were over 6 times more likely than opt-in Sailors to contribute 3 percent, and corresponding ratios for Soldiers and Airmen were even higher. In general, Servicemembers who opted into the BRS were more likely than auto-enrollees to appear in any contribution category other than 3 percent. This may be because Servicemembers who are auto-enrolled can easily minimize the effort involved in selecting a contribution rate by choosing the default level. For Servicemembers who opt in, any effort involved in selecting an optimal contribution rate is incorporated into the decision to opt in. Curiously, however, Sailors who opted into the BRS were less likely than auto-enrollees to contribute below 3 percent; the opposite is true for Soldiers and Airmen.

From March onward, the share of Soldiers and Airmen contributing nothing fell somewhat, while the share of Sailors increased slightly. During this period, the shares of Soldiers and Airmen in every other contribution category increased, and the share of Sailors contributing over 5 percent fell, while the share of Sailors contributing other amounts increased or remained the same.

Marine Corps TSP Contributions

Figure 4 shows contributions among Marines, by eligibility category. These graphs are organized similarly to those for Soldiers, Sailors, and Airmen, with three main differences. The first is that, without observing BRS enrollment status in the Marine Corps, we can state only whether Marines are BRS-eligible or BRS-ineligible. However, for these two groups of Marines, we can show how their TSP contributions changed over 2017, as BRS training was implemented, as well as in 2018, when Marines could opt into the BRS. Recall that auto-enrolled Marines contributing 0 percent to the TSP have been omitted from this figure and subsequent ones.[12]

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[12] However, because fewer than 3 percent of Soldiers, Sailors, or Airmen make TSP contributions of 0 percent in September 2018 or onward, it appears unlikely that this will noticeably distort the TSP contribution rates of Marines with active TSP accounts.

Figure 4.   USMC TSP contribution rates by retirement system eligibility group
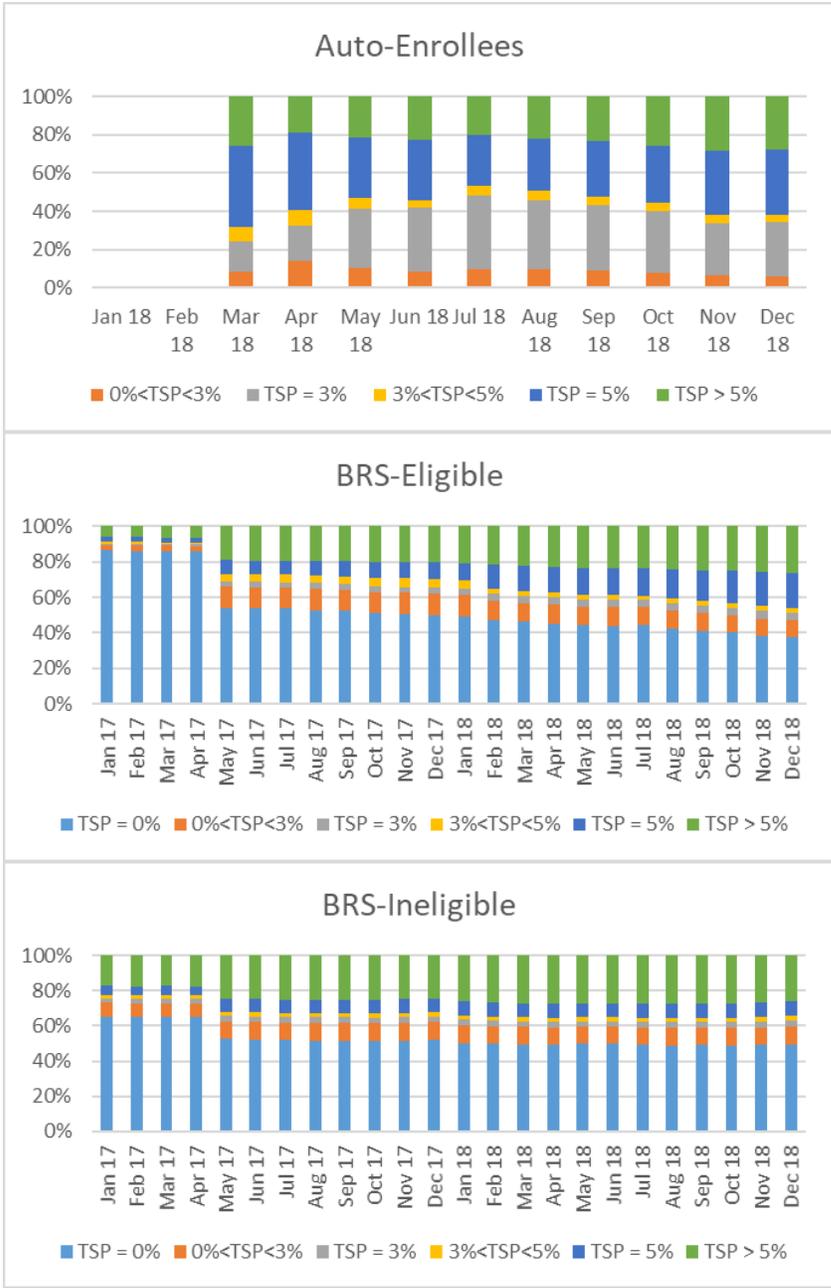
Notes: Sample sizes ranged from 60 (in January) to 15,558 (in December) for auto-enrolled Marines, from 139,378 (in December 2018) to 153,412 (in January 2018) for eligible Marines, and from 24,523 (in December 2018) to 25,268 (in May 2017) for ineligible Marines.
Source: DMDC.

Contribution patterns varied over time and by eligibility category. Auto-enrollees rarely contributed any amount between 0 and 3 percent or between 3 and 5 percent. Although many likely contributed 3 percent because it was the default option, matching rates should not have affected how much they contributed at this time, since auto-enrollees do not receive matching contributions (beyond the automatic 1 percent contribution) until their 25th month of service. Contribution rates greater than 3 percent therefore should reflect a desired savings level in the absence of any incentive.[13]

Contribution patterns were more stable among Marines who became eligible to opt into the BRS in 2018. In May 2017, contribution rates in each contribution category increased dramatically, likely due to BRS training programs, which first became available in March 2017 [32]. Over the rest of 2017, contribution categories greater than 3 percent grew slightly. In 2018, these Marines became eligible for the BRS, with immediate matching for TSP contributions. Although contribution levels did not change noticeably in January 2018, the shares contributing 5 percent and more than 5 percent increased in February and in every subsequent month in 2018. Meanwhile, the share contributing less than 3 percent dropped gradually over 2018. This suggests that Marines who opted into the BRS and had to choose a contribution level were disproportionately likely to seek the maximum matching level.

Contribution patterns were even steadier among BRS-ineligible Marines. These Marines were far more likely to contribute to the TSP prior to May 2017 than those with fewer years of service. However, these graphs alone cannot tell us whether (and/or to what extent) these Marines contributed more to their retirement savings because they (a) were older and therefore felt that retirement saving was more salient, (b) had served with the Marine Corps longer and therefore gave greater thought to the retirement plan the Marine Corps provided, or (c) differed materially from younger Marines in some way unrelated to age or years of service. In May 2017, the likelihood of BRS-ineligible Marines contributing within each category increased, just as it did for those who eventually would become eligible; however, this increase was much smaller. After this increase, all contribution categories stayed relatively stable; by the end of 2018, eligible Marines were contributing to the TSP at a higher rate than ineligible Marines.

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[13] Alternatively, some may base their contributions on the match rate if they do not anticipate that they will remember to update their contribution levels later; however, it would be impossible to evaluate this possibility without conducting extensive Servicemember interviews or observing contribution patterns in 2020 and beyond.

Takeaways

As shown in Table 3, Servicemembers from all four Services frequently failed to maximize the amount of matching funds that they were able to receive. Because Table 3 uses data from December 2018, it should not reflect delays in initial implementation, BRS enrollment, or accession, or other factors that might be relevant earlier in the year. Some individuals may be making suboptimal contributions because they have reached the elective deferral limit (discussed in further detail in its own section); however, it is highly unlikely that this affects over 10 percent of each Service. Likelier explanations include some degree of financial constraint or an impression that only a full match is worth the required contribution.

Table 3.   Inefficient contributions by Service, December 2018

Service	Auto-enrollees		Opt-Ins[b]	
	No Contribution	Less than 5%	No contribution	Less than 5%
Army	1.1%	82.2%	14.2%	27.1%
Navy	0.4%	50.6%	14.1%	29.6%
Air Force	1.5%	75.1%	11.5%	21.0%
Marine Corps	N/A[a]	38.2%[a]	37.7%[b]	54.1%[b]

Source: DMDC and TSP.
[a] Calculations for auto-enrolled Marines omit those contributing 0 percent, as this frequently indicates that the Marine has recently enlisted and does not yet have a TSP account. These results therefore understate the share of Marines contributing 0 percent or contributing any amount less than 5 percent.
[b] Calculations reflect BRS-eligible Marines, rather than those who opted in. Because those who did not opt in had much lower incentives to contribute any given amount, they are disproportionately unlikely to have done so. These results should not be directly compared against those for the other three Services.

There are clear Service-level disparities in the amount that auto-enrolled Sailors and Marines contribute to the TSP relative to Soldiers and Airmen; the latter two are far more likely to select the default contribution rate of 3 percent. Although direct comparisons with the Marine Corps are difficult due to different data sources, auto-enrolled Marines were more likely than Soldiers or Airmen to contribute over 3 percent *even when including Marines who did not yet have TSP accounts*. This suggests that Services presented the default contribution rate differently to auto-enrolled Servicemembers and that Sailors and Marines may have received greater encouragement to select contribution rates other than the default. Alternatively, some Soldiers and Airmen may be choosing the default contribution rate with the intent of increasing it once they can receive matching funds; to evaluate this possibility, we would have to observe their behavior in 2020 and onward, once they qualify.

However, the differences across the Army, Navy, and Air Force are much smaller among those who opted into the BRS. This suggests that Servicemembers' unconstrained behavior will be

similar across Services and that any differences may be limited to how default contribution rates are addressed or the degree of training that auto-enrollees receive on TSP contributions. Although we cannot directly compare contribution rates to those in the Marine Corps, the consistency in contribution levels among Soldiers, Sailors, and Airmen who opted into the BRS suggests that changes in contribution levels over time among eligible Marines may be attributable to additional Marines opting into the BRS rather than changes among those who already have opted in.

BRS enrollees did not necessarily maintain the same TSP contribution in every month. Although a fully study of how Servicemembers changed their contribution rates is beyond the scope of this report, we nevertheless can identify BRS re-enrollees, who would have (inefficiently) ceased their TSP contributions at some point in 2018, at the outset of 2019. These Servicemembers are shown in Table 4.

Table 4.   Auto-enrollment for 2018 and re-enrollment in 2019

Service	Total auto-enrollment for 2018	Re-enrollment at beginning of 2019	Re-enrollment as a percentage of auto-enrollment[a]
Army	54,665	4,664	8.5%
Navy	31,352	334	1.1%
Air Force	29,129	1,903	6.5%
Marine Corps	25,590	83	0.3%

Source: Defense Finance and Accounting Services and DMDC.

[a] This measure may not have a clean interpretation, as some opt-in BRS participants may be included among re-enrollees, and is intended primarily to provide a sense of scale and consistent denominator for each Service.

There are considerably more re-enrollments in the Army and Air Force than in the Navy and Marine Corps. Furthermore, these Service-level differences in re-enrollment are neither proportional to Service size or to Service-level auto-enrollment. As a result, the two Services with the least efficient auto-enrollee contribution also saw the most Servicemembers stop contributing over 2018.

Overall contribution patterns by eligibility category align with findings in the civilian research literature and provide us with several theories for further investigation. First, providing a default contribution level will lead to many more Servicemembers selecting that contribution level, since auto-enrolled Marines were far more likely to contribute 3 percent than those who opted into the BRS. The choice of a default contribution rate could therefore be used to encourage optimal savings behavior. Since the Federal Retirement Thrift Investment Board has recently announced that the default contribution rate for Servicemembers enrolling on or after

October 1, 2020, will increase to 5 percent, Servicemembers entering after this date will probably become much more likely to contribute 5 percent.

Second, before the introduction of BRS training programs, Marines with at least 12 YOS were more likely both to contribute to the TSP and to do so at higher rates than those with fewer than 12 YOS. This finding aligns with prior research, since Marines who were ineligible were older and had more disposable income than those who were eligible. Afterwards, BRS-eligible Marines began contributing to the TSP at a higher rate—whether because they intended to enroll in the BRS, because they had been encouraged to think about retirement planning, because they were made aware of savings options that they had not previously know about, or for some other reason. However, BRS training also appears to have affected Marines who were ineligible. Although additional research would be necessary to determine why this was the case, it is worth considering that changes in behavior may not be limited to the targeted group of Servicemembers.

Lifecycle Differences in TSP Contribution Rates

In the research literature on civilian retirement saving, age and income can affect retirement contributions. We examine how age affected retirement savings among Soldiers, Sailors, and Airmen, and how age, RMC, and enlisted and officer paygrades affected contribution rates among Marines.

TSP contribution rates by age

Figure 5 and Figure 6 show how Soldiers, Sailors, and Airmen of different age groups contributed to TSP accounts; Figure 5 focuses on auto-enrollees, while Figure 6 focuses on opt-ins. These figures use data from September 2018 for comparability across figures. By this point, there is a suitably large sample of auto-enrollees, and it is far enough from the end of the year that it is unlikely for opt-ins to have reached the elective deferral limit on TSP contributions. Both figures show the percentages of Soldiers, Sailors, and Airmen by age grouping in each contribution category. Graphs are organized first by Service, then by age within Service. The length of each bar segment represents the percentage of Servicemembers in that contribution category.

Figure 5. TSP contribution rates by age among auto-enrolled Soldiers, Sailors, and Airmen, September 2018
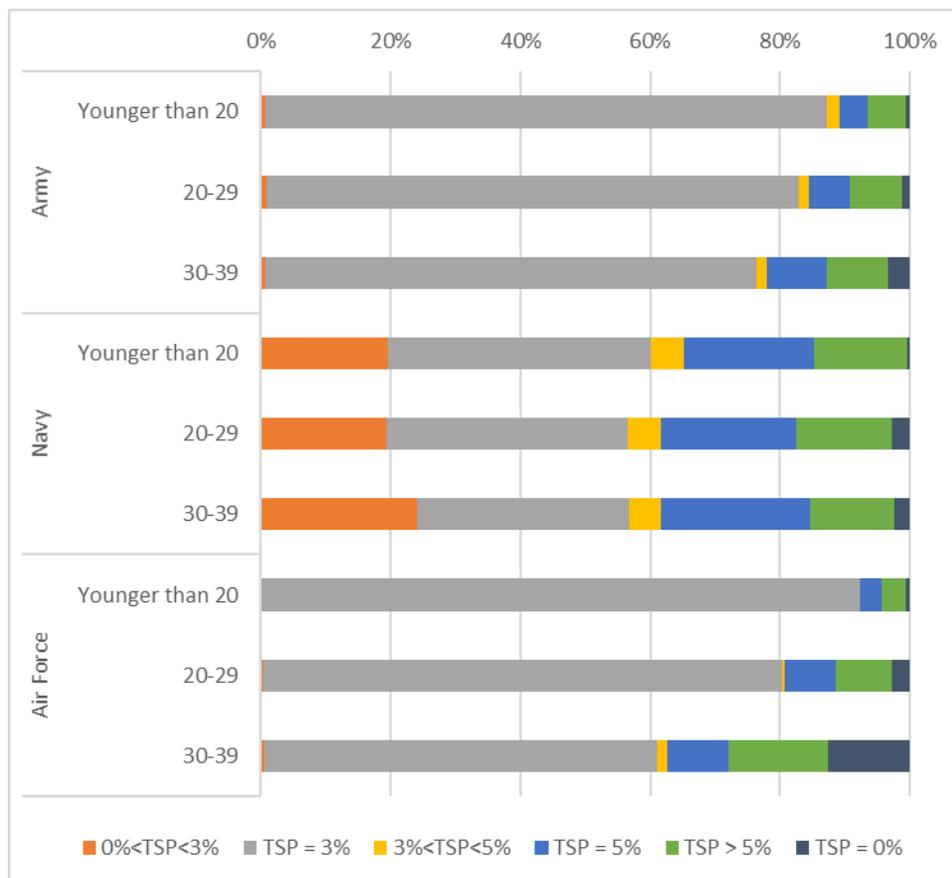
Source: TSP.

The Service-level differences observable in Figure 2 are present across all age groups. However, older auto-enrollees in all three Services were less likely to adopt the default contribution rate of 3 percent. Among Soldiers and Airmen, this reflects a greater likelihood of contributing 5 percent or more to a TSP, but results are more ambiguous among Sailors.

Figure 6. TSP contribution rates by age among opt-in Soldiers, Sailors, and Airmen, September 2018
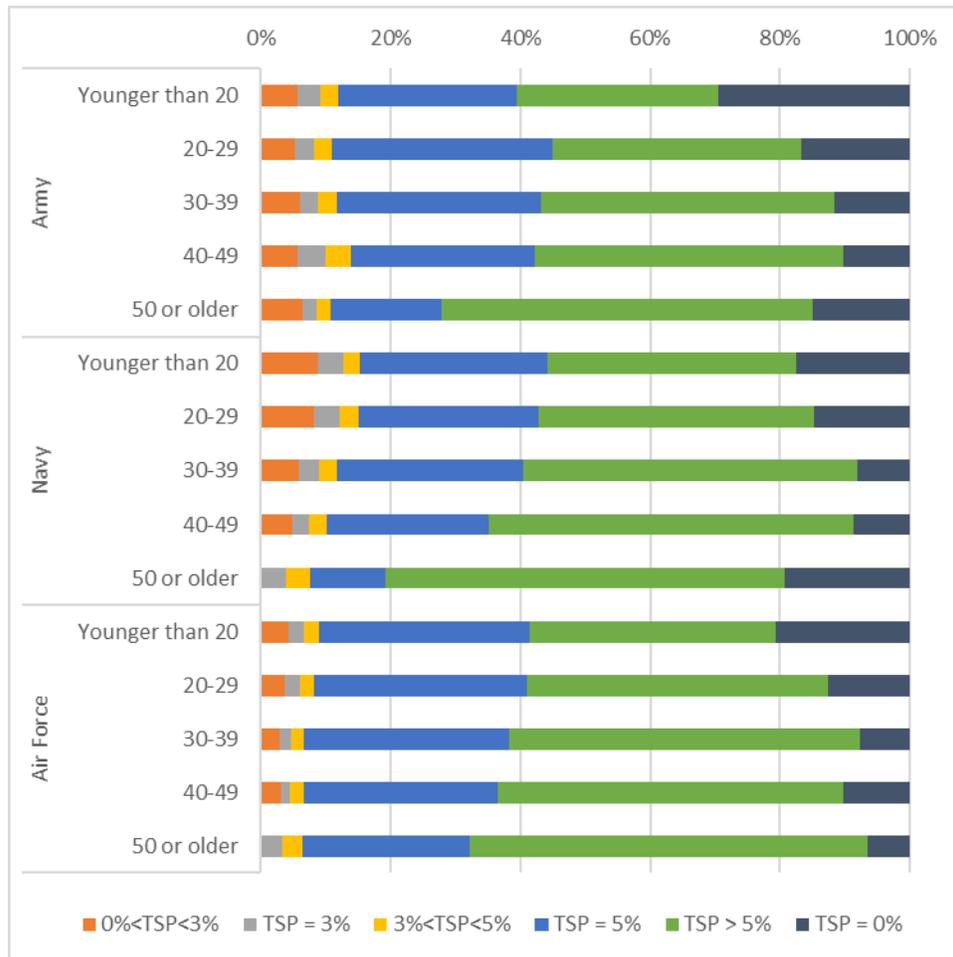
Source: TSP.

Among opt-ins, age is positively correlated with the probability of contributing over 5 percent and negatively correlated with the probability of contributing nothing, but negatively correlated with the probability of contributing exactly 5 percent. Within each Service, opt-ins of all age groups were far less likely than auto-enrollees of any age group to contribute 3 percent. Across all age groups, Soldiers were less likely than Sailors or Airmen to contribute over 5 percent; Soldiers younger than 40 also were more likely than Sailors or Airmen to contribute nothing.

Figure 7 shows contribution rates among Marines by age and eligibility group. As in Figure 4, we omit Marines who made no TSP contribution because it is likely to reflect the lack of a TSP account rather than a conscious decision to make no contribution. In addition, while graphs for Soldiers, Sailors, and Airmen use their age at any given point in time, graphs for Marines use their age *as of January 1, 2018*.[14] This means, for example, that a Marine whose birthday is January 2, 1998, will remain in the "younger than 20" category, even though he or she has turned 20 prior to appearing in the graph below.

Figure 7.   TSP contribution rates by age and eligibility category among Marines, September 2018
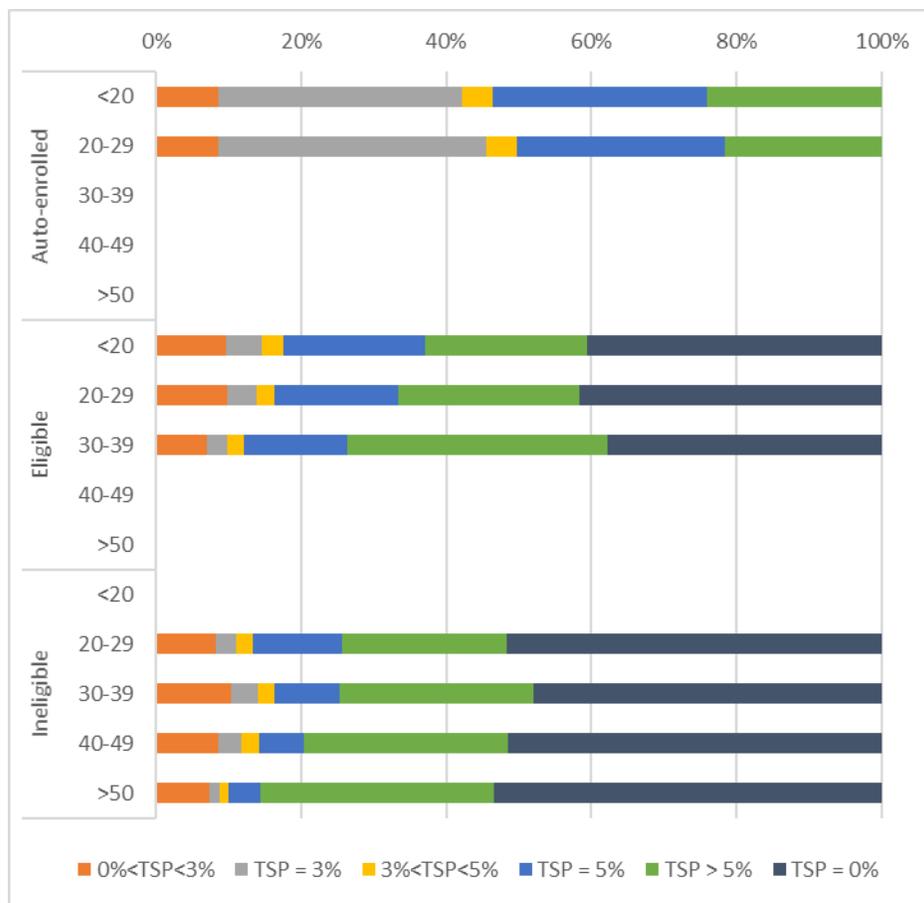
Source: DMDC.

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[14] DMDC data contained Marines' dates of birth, from which it was possible to manually compute age as of any given reference date. We chose January 1, 2018, since it was the date the policy went into effect.

In contrast to both the civilian literature and the other three Services, auto-enrolled Marines aged 20–29 contributed less to the TSP (conditional on making any contribution) than those younger than 20. Among BRS-eligible Marines, age was positively correlated with the probability of contributing over 5 percent to the TSP and negatively correlated with contributing lower amounts. Curiously, older BRS-ineligible Marines were simultaneously less likely to make any TSP contribution yet more likely to contribute over 5 percent.

TSP contribution rates by paygrade and RMC (Marine Corps only)

Figure 8 and Figure 9 show how contribution rates varied by officer and enlisted paygrade, respectively, for each eligibility category. Because the TSP Office did not have access to Servicemembers' paygrades, this analysis is restricted to the Marine Corps. We show graphs for only a subset of paygrade and eligibility group combinations. Some combinations are impossible as a matter of policy—for example, an auto-enrolled Marine will not reach E9 within one year of enlisting. Others are possible but occur so infrequently as to provide little usable information—for example, some auto-enrolled Marines reach E6, and some Marines with 12 or more years of service are demoted to E1, but it would be inappropriate to regard these Marines as representative of any broader patterns or make inferences based on their behavior.

Figure 8 shows contributions among enlisted Marines. Auto-enrolled Marines at paygrade E2 were more likely than those at E1 (conditional on TSP contribution) to contribute 3 percent but less likely to contribute 5 percent or more. Eligible Marines at paygrades E3 through E7 were similarly likely to contribute to the TSP; however, the precise amount contributed by paygrade differs—in particular, eligible Marines at E5 or higher were more likely than those at E3 or E4 to contribute over 5 percent to the TSP. For ineligible Marines, paygrade appears to be *negatively* correlated with the probability of contributing to the TSP. While ineligible Marines at paygrades E8 and E9 are as likely as those at E6 and E7 to contribute over five percent to the TSP, they are less likely to have any other contribution rate.

**Figure 8.** TSP contribution rates by enlisted paygrade and eligibility category among Marines, September 2018
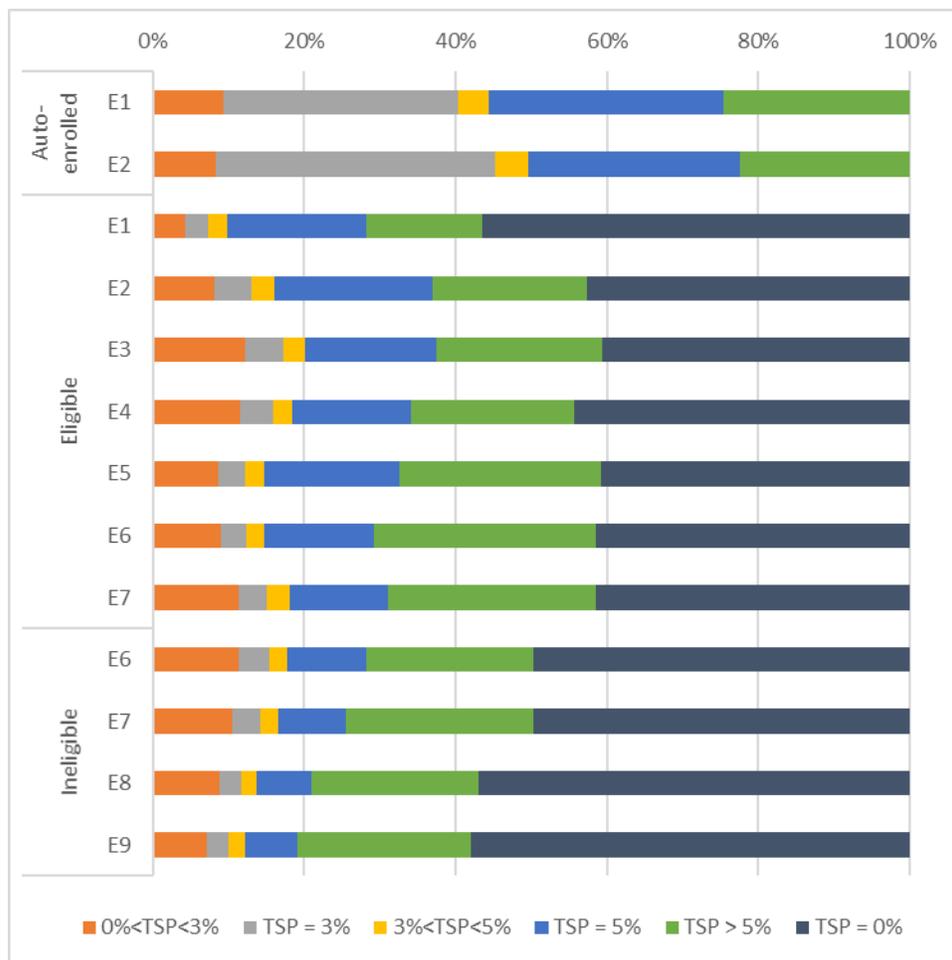
Source: DMDC.

Figure 9 shows contributions among Marine officers. We omit auto-enrollees, as there were only 42 auto-enrolled Marine officers as of September 2018; the most there were in any given month in 2018 was 156 in November. Both BRS-eligible and BRS-ineligible O1s are much less likely than O2s to contribute to the TSP or to contribute over 5 percent; this may reflect differences in basic pay or RMC, but is not immediately clear. At O2 and above, BRS-eligible Marines with higher paygrades had lower probabilities of contributing to the TSP at all, reflected in substantially lower probabilities of contributing five percent or more. Among BRS-

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ineligible Marines, higher paygrades above O2 are also correlated with lower probabilities of contribution to the TSP, though differences in individual contribution levels are less dramatic.

Figure 9.   TSP contribution rates by officer paygrade and eligibility category among Marines, September 2018
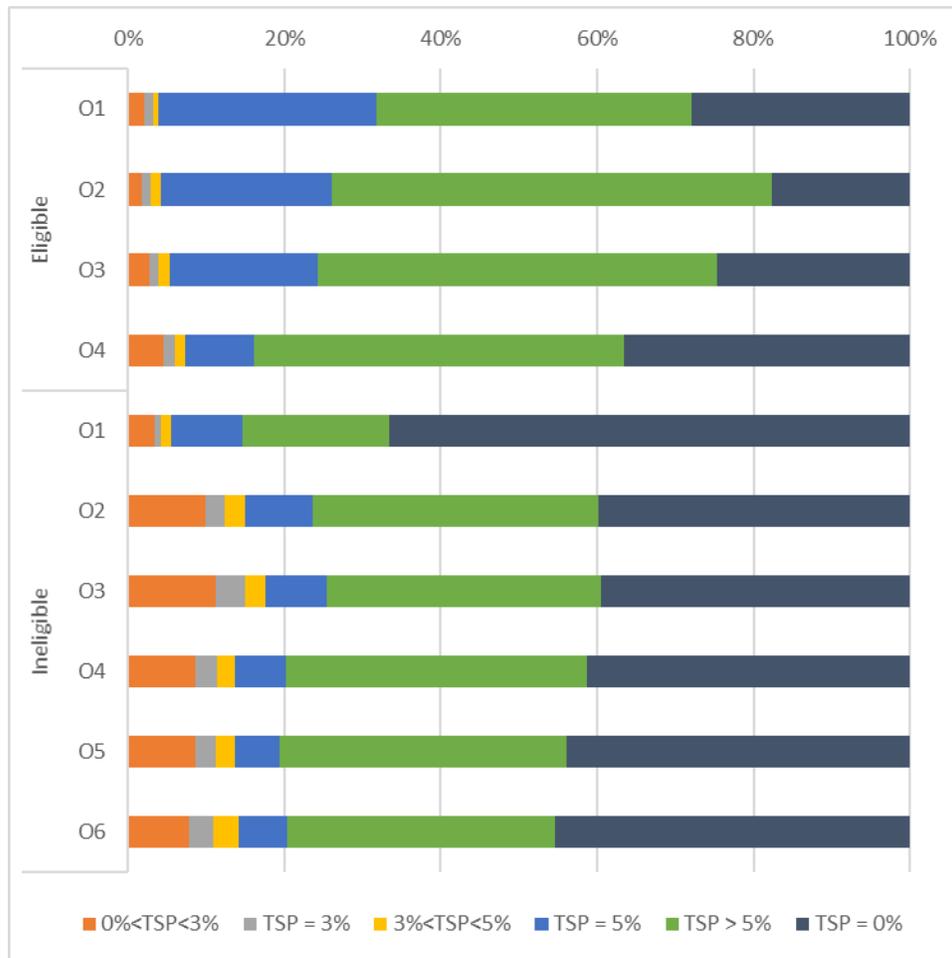
Source: DMDC.

Figure 10 shows how Marines' TSP contribution levels vary by RMC. It is organized similarly to the two figures above, but shows auto-enrollees both including and omitting zero contribution levels. While paygrade is one of the factors determining RMC, it is unlikely that attaining higher paygrades *in and of itself* causes certain Marines to change their contribution levels. It is much more plausible that a change in RMC would cause this (e.g., if Marines prefer to meet a certain subsistence-level basic pay before saving for retirement). Although we cannot

fully isolate the effect that RMC has on Marines' TSP contribution levels, we can nevertheless examine how it varies with TSP contributions.

Figure 10. TSP contribution rates by RMC and eligibility category among Marines, September 2018
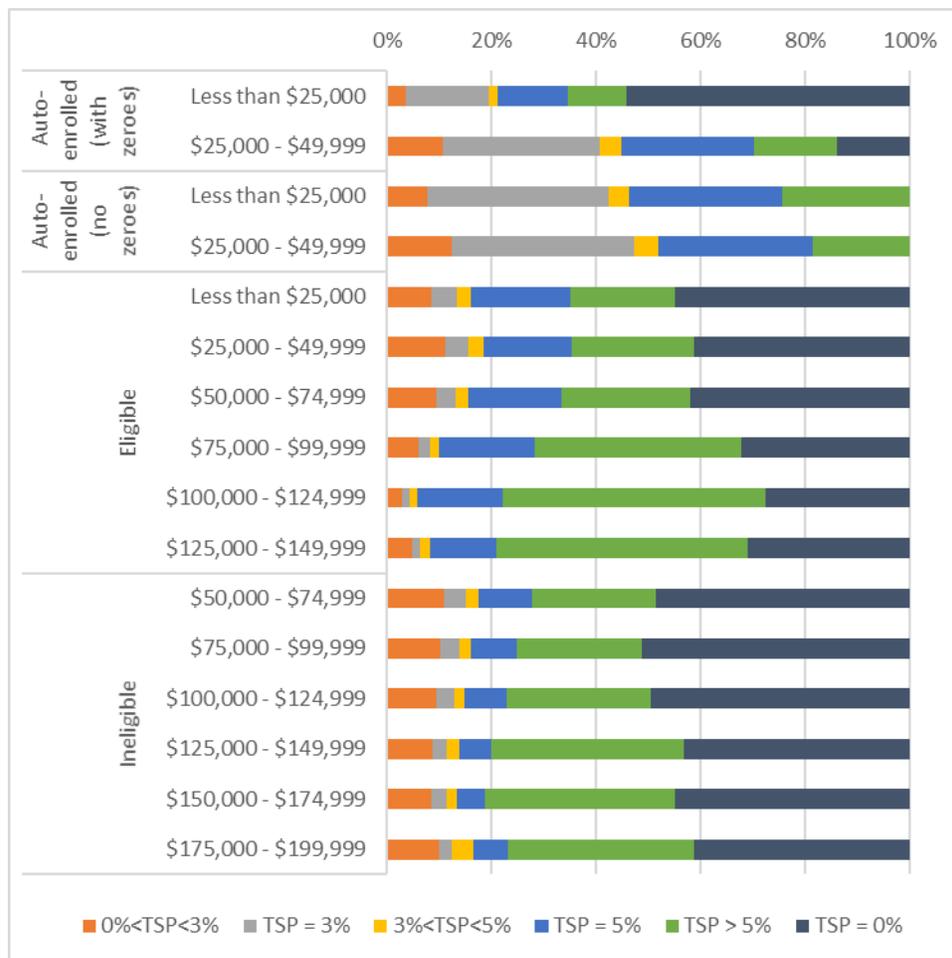
Source: DMDC.

Auto-enrollees earning less than $25,000 were much less likely than those earning higher levels of basic pay to contribute to the TSP at all. This may reflect the need for a certain level of baseline income before Marines are willing to devote part of their paycheck to retirement saving. However, there are two competing reasons that might take precedence. First, Marines who do not yet have TSP accounts are more likely than those who do to be earning less than $25,000; some portion of the contribution gap reflects an inability to contribute, rather than a

choice to do so. Second, enlisted auto-enrolled Marines in 2018 would be unable to earn $25,000 in RMC through basic pay alone – with less than 2 YOS, an enlisted Marine would have needed to rate E4 to do so. As a result, auto-enrolled Marines would have needed to either rate BAH or be officers to have earned at least $25,000 in RMC.[15] Auto-enrollees who earned at least $25,000 in RMC may therefore have additional systematic differences from those who did not, making it challenging to assess which factors are causing different contribution rates. Omitting Marines who contributed zero percent to the TSP, however, is the difference between Marines who earned less than $25,000 contributing less in every non-zero category than those earning at least $25,000 versus being substantially more likely to contribute over five percent and less likely to contribute less than three percent.

For eligible Marines earning less than $125,000, basic pay levels were positively correlated with both the probability of making any TSP contribution and the probability of contributing over 5 percent. However, eligible Marines earning between $125,000 and $149,999 were less likely to contribute to the TSP or to contribute over 5 percent than those earning between $100,000 and $124,999. They also were the least likely group to contribute 5 percent. Eligible Marines who earned less than $25,000 were the most likely to contribute 3 percent, 5 percent, or any amount in between.

Among ineligible Marines, it makes sense to think about those earning less than $125,000 separately from those earning at least $125,000. Those earning less than $125,000 are less likely to contribute to the TSP, more likely to contribute exactly five percent, and substantially less likely to contribute over five percent. In general, the probability of contributing over five percent is positively correlated with RMC.

Takeaways

Contribution rates appear to be strongly correlated with both paygrade and RMC; however, it is likely that RMC is the more relevant factor. Marines with low incomes may wish to prioritize immediate necessities over future savings, limiting the effectiveness of matching plans; however, this result might also be explained by factors such as rating BAH, officership, or other characteristics separate from RMC itself. Among BRS-eligible and BRS-ineligible Marines, though, the probability both of contribution and of contributing over five percent is positively correlated with RMC, suggesting that earnings do play some role in contribution levels.

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[15] For context, the annualized basic pay of an auto-enrolled E1 in our data with less than four months of service would have been approximately $18,192. Any BAH payment over $567.33 would therefore result in earning at least $25,000 per year.

The Elective Deferral Limit

Since matching funds are distributed in each month and are determined by the percentage of basic pay contributed in that month, the timing of TSP contributions may matter as much as the total amount contributed over the course of a year. As an extreme case, consider a Servicemember who contributes 36 percent of his or her basic pay in one month and nothing else for the remainder of the year and another Servicemember who contributes 3 percent of the same basic pay in every month. The first Servicemember will receive a 5 percent match in January and the automatic 1 percent contribution in the remaining 11 months (for a total of 16 percent of monthly basic pay), while the second will receive 4 percent of basic pay in every month (for a total of 48 percent of monthly basic pay).[16]

A less extreme version of the scenario above involves Servicemembers reaching the TSP elective deferral limit prior to December. TSP contributions are capped on several dimensions: direct employee contributions have an elective deferral limit ($18,500 for 2018), while automatic and matching contributions made by employers have an annual addition limit ($55,000 for 2018). If this happens, they still will receive the automatic 1 percent contribution in any remaining months, since the limit applies only to personal contributions, not to employer contributions; however, any months in which a Servicemember cannot contribute due to the deferral limit will result in forgone matching funds.

While we are unable to show conclusively that this happens on a regular basis, we can show some evidence consistent with reaching the elective deferral limit. Figure 11 shows contributions by BRS-eligible Marine O4s. In this figure, there is a clear drop in both overall contribution rates and in the share of Marines contributing over 5 percent of basic pay toward the end of both calendar years. This is what we would expect to see if a Marine reaches the contribution limit; to reach the 2018 limit of $18,500, a Marine would have needed to contribute an average of $1,541.67 per month, which is substantially higher than 5 percent of any monthly rate in the 2018 basic pay tables. Importantly, the share of Marines contributing to TSP accounts reaches local maxima in June 2017 and September 2018, so some Servicemembers may be forgoing several months of matching funds.

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[16] While this example does not consider interest accrual over the course of the year, there is no realistic interest rate that would make the first Servicemember's savings pattern preferable to the second's.

Figure 11. Evidence that eligible Marine Corps O4s may reach the elective deferral limit too soon
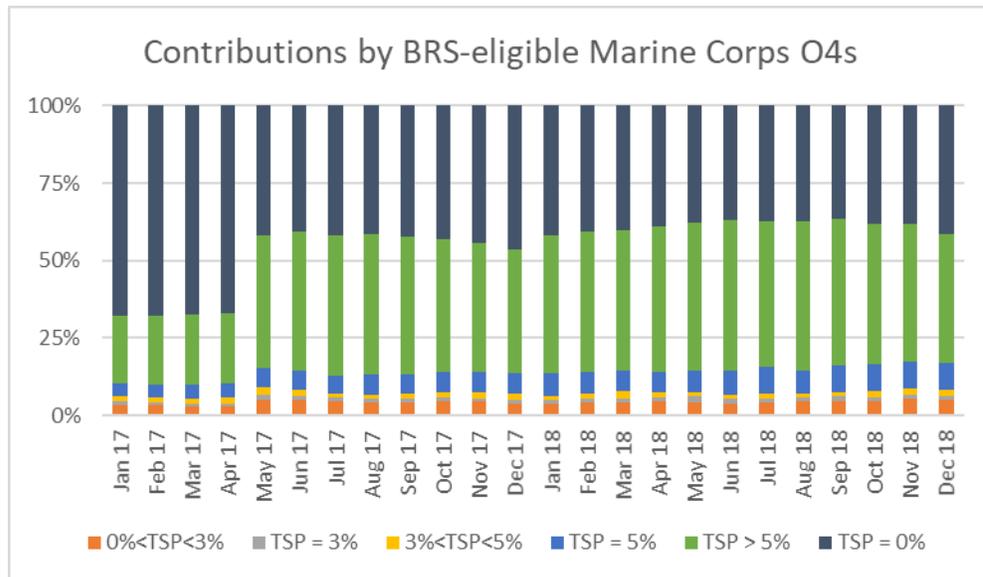
Source: DMDC.

Table 5 illustrates potential forgone investment using the example of a Marine O4 with 11 YOS—the highest-earning combination of service length and paygrade for a BRS-eligible individual. This Marine would have earned $7,052.70 each month in 2018. If this Marine contributed 25 percent of his or her basic pay, he or she would only be able to contribute through November before reaching the $18,500 cap. During this time frame, they would receive $352.64 in matching contributions, but would only receive the automatic contribution of $70.53 in December. By contrast, a Servicemember who contributed approximately 21.9 percent in each month would receive the full $352.64 match in every month, earning an additional $282.11 in matching funds while reaching the same personal TSP contribution of $18,500.[17]

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[17] To put this in context, a Servicemember who forgoes $282.11 per year, with a 5 percent interest rate compounded monthly would lose a total of $10,468.58 over 20 years.

Table 5. Example of effects of an O4 with 11 YOS reaching contribution limit

Month	Monthly Basic Pay	Personal Contribution	Match	Total Contribution	Cum. Total Contribution	Cum. Personal Contribution
Contributing 25% of Basic Pay						
January	$7,052.70	$1,763.18	$352.64	$2,115.81	$2,115.81	$1,763.18
February	$7,052.70	$1,763.18	$352.64	$2,115.81	$4,231.62	$3,526.35
March	$7,052.70	$1,763.18	$352.64	$2,115.81	$6,347.43	$5,289.53
…		…				…
October	$7,052.70	$1,763.18	$352.64	$2,115.81	$21,158.10	$17,631.75
November	$7,052.70	**$868.25**	**$352.64**	**$1,220.89**	$22,378.99	$18,500.00
December	$7,052.70	**$0.00**	**$70.53**	**$70.53**	**$22,449.51**	$18,500.00
Contributing 21.9% of Basic Pay						
January	$7,052.70	$1,541.72	$352.64	$1,894.36	$1,894.36	$1,541.72
February	$7,052.70	$1,541.72	$352.64	$1,894.36	$3,788.71	$3,083.44
March	$7,052.70	$1,541.72	$352.64	$1,894.36	$5,683.07	$4,625.16
…		…				…
October	$7,052.70	$1,541.72	$352.64	$1,894.36	$18,943.55	$15,417.20
November	$7,052.70	**$1,541.72**	**$352.64**	**$1,894.36**	$20,837.91	$16,958.92
December	$7,052.70	**$1,541.08**	**$352.64**	**$1,894.36**	**$22,732.26**	$18,500.00

Source: Defense Finance and Accounting Service 2018 Military Active & Reserve Component Pay Table.

There are several scenarios in which Marines might reach the elective deferral limit prior to December in any given year. First, they may simply have very high baseline contribution levels. However, this is unlikely to occur commonly across the Marine Corps—even the highest earning BRS-eligible Marines would need to contribute over a fifth of their salary in every month to reach the limit.

Brockert (2019) mentions two other scenarios in which Marines might increase their TSP contribution levels, and which could therefore lead Marines to reach the elective deferral limit too quickly. First, Marines may increase their contributions while deployed, since their immediate needs are being accounted for by the Marine Corps. For those in combat zones, this may be a sensible choice, as traditional TSP contributions made in a combat zone apply to the annual addition limit rather than the elective deferral limit. However, Marines deployed outside of combat zones or making Roth contributions still face the elective deferral limit and

may therefore reach it at an inefficiently early date.[18] Second, Marines could increase their contribution levels upon receiving one-time bonus pay. In this case, all contributions will still count towards the elective deferral limit.

This issue currently affects relatively few Marines, but could become more salient in time. Because Servicemembers with 12 YOS or more were ineligible for BRS enrollment, the highest earning Marines (who may therefore be most likely to reach the elective deferral limit) do not have matching contributions to forego. However, as current enrollees gain additional YOS, their basic pay rates will increase, and so will their TSP contributions; they will also begin to attain higher paygrades than those we currently observe them holding. Nevertheless, this issue will be more applicable to officers rather than enlisted Servicemembers, as an O3 earns more in basic pay than an E9.[19]

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[18] Servicemembers deployed to combat zones should generally make Roth contributions below the elective deferral limit. Roth contribution plans differ from traditional plans in applying taxes at contribution rather than at withdrawal; Roth contributions made in combat zones are exempt from these up-front taxes, allowing Servicemembers in combat zones to make completely tax-free contributions. Contributions above the elective deferral limit should instead come from traditional contributions. Comparison of taxes avoided via Roth contributions versus contributions foregone by reaching the elective deferral limit depends on when in the calendar year a Servicemember is deployed, for how long TSP contributions will accrue interest, and a forecast of future tax rates, and is therefore beyond the scope of our analysis.

[19] Making specific predictions beyond 2019 would require either estimating changes in both the basic pay table and the elective deferral limit or assuming that the same proportional changes apply to each. Using 2019 values, an E9 with 20 YOS would need to contribute over 25 percent of his or her basic pay to reach the elective deferral limit, while an E5 with 20 YOS would need to contribute slightly over 17 percent.

Implications of the Single-Salary System

The effects of a single-salary system on TSP contribution rates and its costs to DOD and the federal government depend on the structure of the single-salary system, which has not yet been well defined. However, we can start with the assumptions used by IDA in their briefing concerning the Salary-Based Pay System [34]. They start by assuming that "all allowances are redistributed as basic pay across the entire force." They conclude that this would increase current basic pay by 69 percent. Based on this increase and a retirement pay accrual calculated at 30.4 percent of basic pay, they conclude an extra cost of 11.8 billion to DOD and 9.9 billion to the federal government. However, this does not include higher costs to match higher Service contributions to the TSP.

If Servicemembers' contribution rates are not affected by the move to a single-salary system, an increase in basic pay by a factor of 1.69 would also increase Service matching contribution levels by 69 percent. However, the single-salary system is likely to increase take-home pay for some Servicemembers and decrease it for others [34]. An increase or decrease in take-home pay may induce Servicemembers to change their contribution rates. This, in turn may increase or decrease the costs to DOD.

Finally, the Federal Retirement Thrift Investment Board (FRTIB) recently announced that the default contribution rate for people automatically enrolled on or after October 1, 2020, will be increased from 3 percent to 5 percent [35]. Given that Servicemembers auto-enrolled in the BRS are likely to contribute the default rate or higher, the change in the default rate likely implies even higher TSP costs for DOD.

Conclusion and Recommendations

Our Marine Corps analysis shows that auto-enrolled participants are more likely to contribute the default 3 percent contribution than those who opt to participate. Contribution rates for the Army, Navy, and Air Force reveal that auto-enrollees are much more likely to contribute the default 3 percent rate while the majority of Servicemembers who opt in contribute 5 percent or more. This may be the result of two factors. First, auto-enrolled participants are assigned a default contribution rate of 3 percent, while those opting in must choose a contribution rate. The civilian retirement literature indicates that people are likely to choose the easiest path, which for auto-enrolled participants is to stick with the default rate. Second, opt-in participants immediately receive Service matching contributions, while auto-enrolled participants must complete two YOS to receive full Service matching contributions. This may be inducing opt-in participants to contribute more—a result consistent with the civilian literature.

> **Recommendation:** *If the Services view higher contribution rates as a positive outcome, they could increase the default contribution rate of auto-enrollees or allow for immediate Service-level matching for auto-enrolled participants.*

> **Recommendation:** *We cannot separately observe both those who opt in to the BRS and those who remain in the legacy system. Because those opting in have high contribution rates, the Services may be more interested in the proportion who participate—a topic for future research.*[20]

A second interesting result for the Army, Navy, and Air Force is that Sailors have very different contribution rates than Soldiers or Airmen. In the Army and Air Force, auto-enrollees are much more likely to stick with the default contribution rate, while those in the Navy are the most likely to contribute more than the default rate.

> **Recommendation:** *Investigate why the Navy has higher contribution rates than the other Services, and potentially apply its method to the other Services.*

A third finding, which may be immediately actionable at relatively low cost, is that a small number of Servicemembers may reach the annual limit on elective contributions to the TSP before the end of the year and thereby end up forgoing matching funds. It should be relatively inexpensive to compute the maximum contribution rate at which a Servicemember would optimize his or her matching funds, based on the TSP-provided contribution limit and military

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[20] A recent study found that only 50 percent of the eligible Marine Corps population opted in (officers and enlisted) [19]. This study did not evaluate opt-in rates across the Services.

pay charts by paygrade and YOS. Given the stability in military pay relative to civilian pay, it could additionally take into account any raises based on YOS without a significant increase in effort.[21] This could be incorporated as highlighted value on any paperwork or electronic forms or as an error message or confirmation prompt on electronic forms.

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[21] While increases in paygrade might not be as easily predicted, this could be incorporated into any paperwork necessary at promotion.

Appendix A: Auto-enrolled Marines Contributing 0 percent to the TSP

Figure 12 shows how auto-enrolled Marines' TSP contribution rates varied by month in 2018, when including all zero values; the vast majority of these are likely to reflect newly-enlisted Marines who do not yet have TSP accounts set up rather than Marines choosing not to contribute, but we are unable to determine how often either is the case. However, it is almost certainly why auto-enrollees contributed none of their basic pay in January 2018. As Marines' TSP accounts are set up, they begin contributing; however, because new Marines enlist every month, there are always some who do not contribute simply because they cannot. As a result, the graph for auto-enrollees consistently overstates the number of Marines who wish to contribute nothing and understates all other contribution levels. Contribution shares also may be affected by months in which many Marines enlist. For example, if 30 Marines are enlisted and contribute to the TSP but another 20 do not yet have TSP accounts, then 60 percent contribute. If in the following month another 50 Marines enlist—with the resulting lag in TSP account creation—then the share contributing to the TSP will fall *even if the 20 who were not contributing previously all begin to do so*. The influx of new recruits likely explains why contribution levels appear to fall in September 2018.

Figure 12. USMC TSP contribution rates by auto-enrollees, including zero values
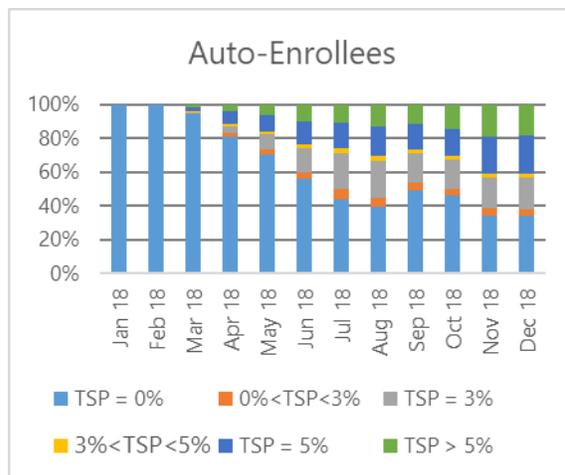
Source: DMDC.

Appendix B: Contributions over Time by Servicemember Characteristics

In this section, we present TSP contribution rates over 2018 for auto-enrollees and over 2017 and 2018 for BRS-eligible and BRS-ineligible Marines based on their characteristics. Because Servicemembers may react differently to policy changes over time, the progression of contribution rates may be of additional interest above and beyond snapshots. This appendix includes auto-enrolled Marines who do not contribute to TSP accounts.

USMC contributions by paygrade

Enlisted paygrade

Figure 13, Figure 14, and Figure 15 show how TSP contributions vary by enlisted paygrade for each BRS eligibility group. We do not include graphs for every combination of paygrade and eligibility group. Some are impossible as a matter of policy—for example, an auto-enrolled Marine will not reach E9 within one year of enlisting. Others are possible but occur so infrequently as to provide little usable information—for example, some auto-enrolled Marines reach E6, and some Marines with 12 or more years of service are demoted to E1, but it would be inappropriate to regard these Marines as representative of any broader patterns or make inferences based on their behavior.

Figure 13 shows contributions by auto-enrolled Marines in paygrades E1 and E2. Readers should note that while auto-enrolled Marines in E2 appear more likely to contribute at each non-zero level than those in E1, this may be because Marines in E1 are much less likely to have active TSP accounts; after removing zero values, auto-enrolled Marines in paygrade E1 are more likely to contribute five percent or more.

Figure 13.   USMC TSP contribution rates by enlisted paygrade, auto-enrollees, 2018
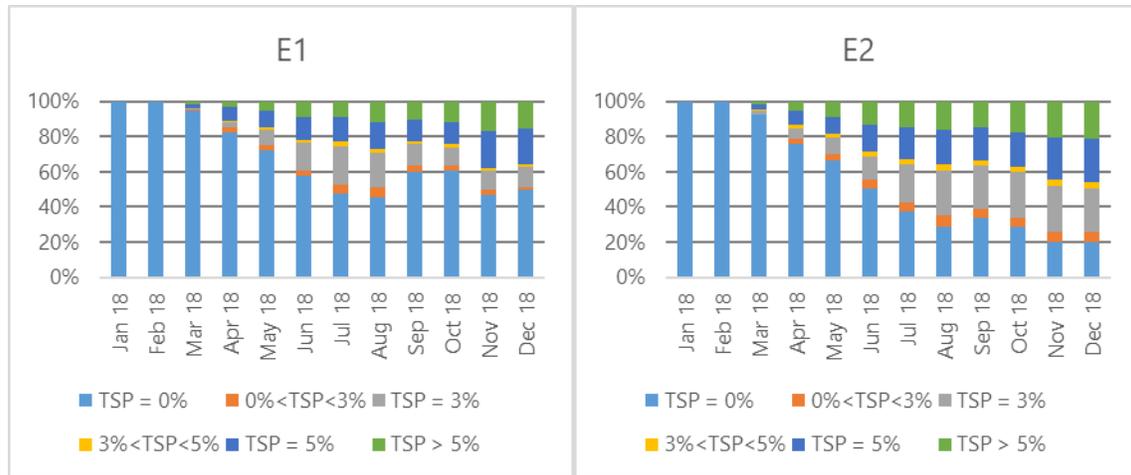
Notes: Among E1s, sample sizes ranged from 41 (in January) to 7,707 (in December). Among E2s, sample sizes ranged from 16 (in January) to 7,262 (in December).
Source: DMDC

Figure 14 shows contribution rates for paygrades E2 through E7 among Marines who were eligible for the BRS. Eligible Marines at paygrade E2 had notably different contribution patterns than those at higher paygrades; in particular, they were much more likely to contribute between 3 and 4 percent between May 2017 and January 2018. Although there is a clear positive correlation prior to May 2017 between enlisted paygrade and contributing to the TSP, eligible Marines at pay grades E3 through E7 were similarly likely to contribute to the TSP; between 40 and 50 percent contributed in May 2017 and approximately 60 percent contributed in December 2018. However, the precise amount contributed by paygrade differs—in particular, eligible Marines at E5 or higher were more likely than those at E3 or E4 to contribute over 5 percent to the TSP and less likely to contribute exactly 5 percent.

Figure 14. USMC TSP contribution rates by enlisted paygrade, eligible for the BRS, 2017–2018
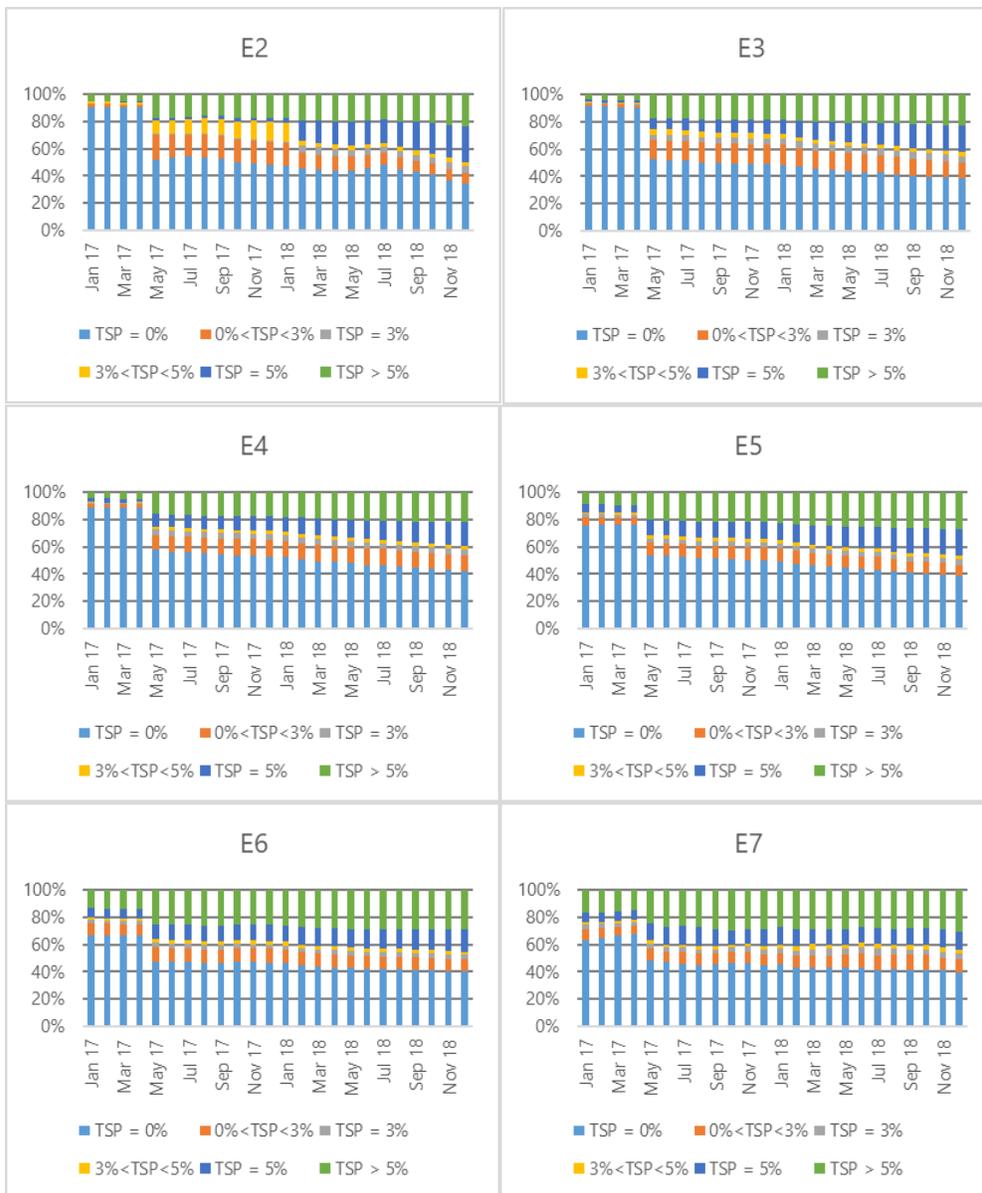
Notes: For E2s, sample sizes ranged from 11,637 (in December 2018) to 21,298 (in February 2018). For E3s, sample sizes ranged from 41,142 (in October 2017) to 43,594 (in May 2018). For E4s, sample sizes ranged from 34,059 (in August 2017) to 35,717 (in June 2018). For E5s, sample sizes ranged from 25,002 (in October 2018) to 25,582 (in June 2017). For E6s, sample sizes ranged from 7,770 (in September 2017) to 9,951 (in December 2018). For E7s, sample sizes ranged from 258 (in September 2017) to 406 (in February 2018). Source: DMDC.

Figure 15 shows contribution rates for paygrades E6 through E9 among Marines who were ineligible for the BRS. In general, for these Marines, paygrade appears to be negatively correlated with the probability of contributing to the TSP. Ineligible Marines at paygrades E8 and E9 are noticeably less likely to contribute less than 3 percent or exactly 5 percent to the TSP than those at E6 or E7, but differences in contribution patterns by paygrade are much smaller for this group of Marines than for auto-enrolled or eligible Marines.

Figure 15.   USMC TSP contribution rates by enlisted paygrade, ineligible for the BRS, 2017–2018
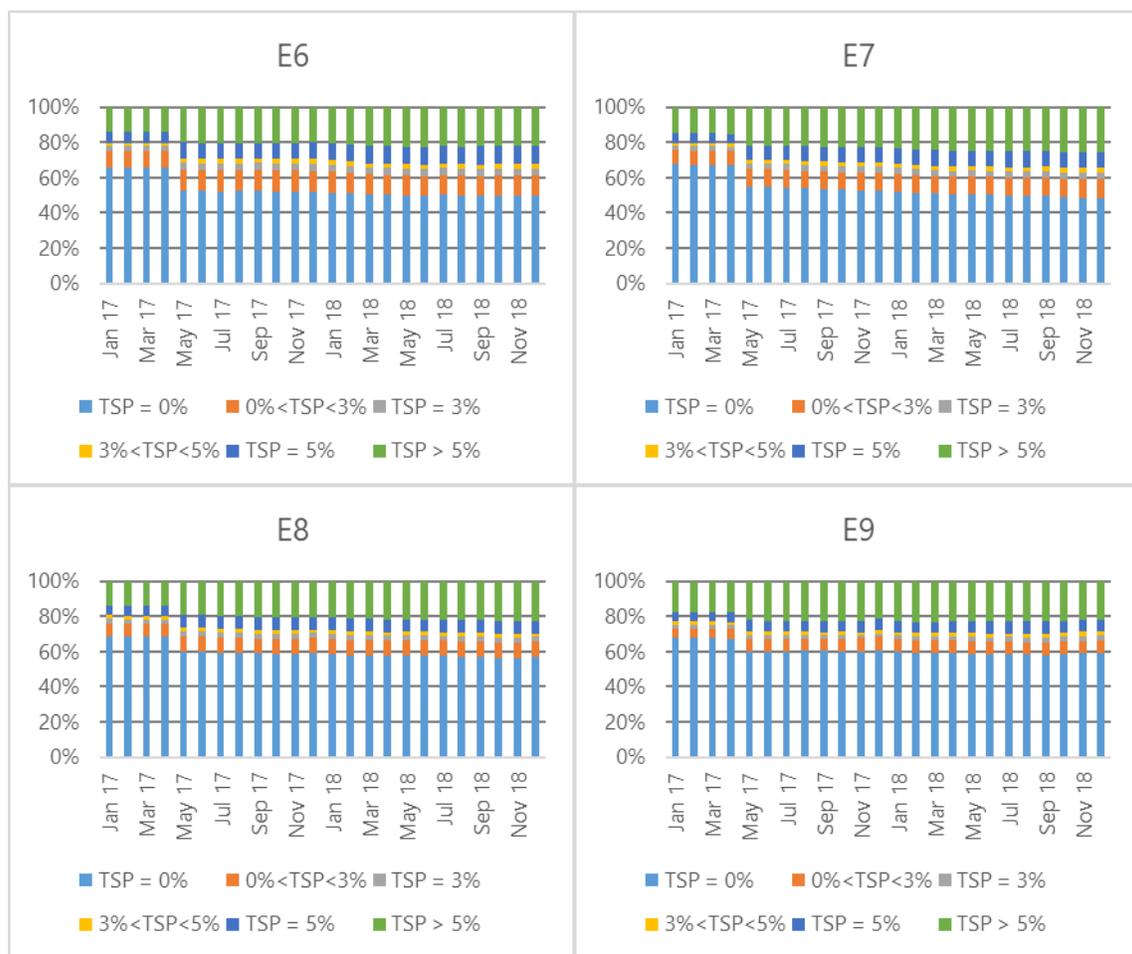
Notes: For E6s, sample sizes ranged from 4,329 (in October 2018) to 5,265 (in June 2017). For E7s, sample sizes ranged from 6,609 (in June 2017) to 7,328 (in December 2018). For E8s, sample sizes ranged from 3,135 (in January 2018) to 3,363 (in September 2018). For E9s, sample sizes ranged from 1,375 (in September 2017) to 1,415 (in November 2017).
Source: DMDC.

Officer paygrade

Figure 16 shows TSP contributions for auto-enrolled Marines in paygrade O1; no auto-enrolled Marines appeared in any other officer paygrade.[22] This figure contains barely enough Marines to be interpretable—the first month with more than 10 Marines is August 2018, and the highest number of Marines in any given month is 156 (in November 2018). Nevertheless, influxes of Marines in August 2018 and November 2018 are visible as spikes in the number of Marines who do not yet have TSP accounts (and therefore cannot contribute toward them). However, the month after each of these two shocks, the contribution rate rises to over 90 percent. Although additional data are necessary to observe longer term patterns, it appears at a glance that auto-enrolled officers are substantially more likely than auto-enrolled enlisted Marines to contribute the default amount to the TSP.[23]

Figure 16. USMC TSP contribution rates for O1, auto-enrollees, 2018
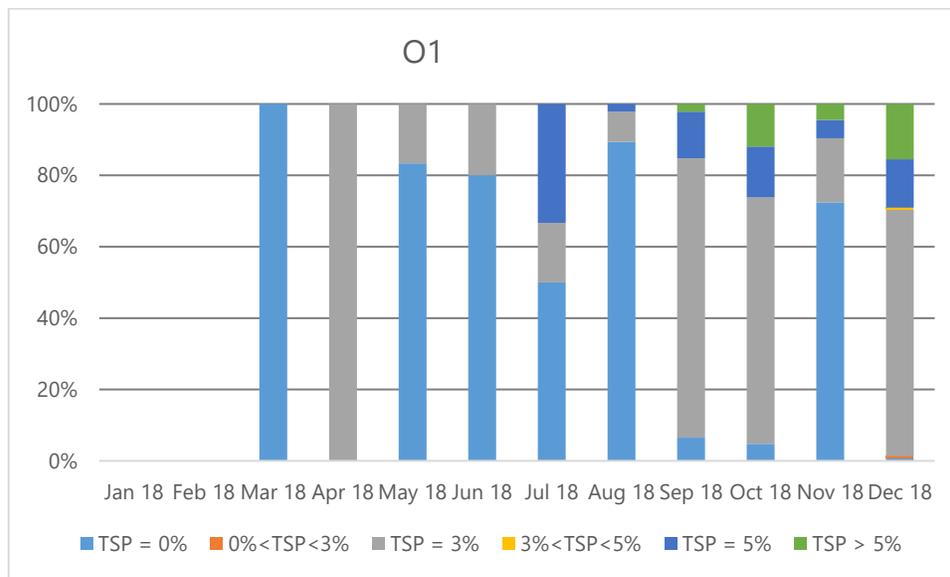
Notes: Sample sizes ranged from 1 (in March and April) to 156 (in November).
Source: DMDC.

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[22] We omit discussion of warrant officer paygrades because they contain relatively few Marines, none of whom were auto-enrolled.

[23] Based on December 2018 values, enlisted Marines may be more likely to contribute any amount other than the default; however, this could change as more Marines determine their ideal contribution levels or become officers.

Figure 17 shows TSP contributions by paygrades O1 through O4 among Marines who were eligible for the BRS.[24] Prior to May 2017, officer paygrade was positively correlated with the likelihood of contributing to the TSP at all or appearing in any given contribution category. After 2018, these officers became much more likely to contribute to TSP, chiefly at levels over 5 percent. The likelihood of contributing exactly 5 percent, meanwhile, became negatively correlated with officer paygrade. The entry and promotion schedule for officers explains some of the variation in the O1 graph—more than 450 officers leave paygrade O1 and more than 400 enter paygrade O2 in May of each year in our data, followed by an influx at O1 the following month.[25] The new officers at O1 may need time to establish their TSP accounts—explaining the gradual rise in contributions between June 2017 and June 2018—but those promoted to O2 have had plenty of time to determine their ideal contribution rates.

Some contribution patterns among Marine officers may reflect hitting the elective deferral limit. Among O2s, contribution rates had nearly flattened by December 2017 after a gradual rise. In January 2018, their contribution rates began to rise again (quickly in the beginning of the year, but more slowly afterwards). Among O3s, contribution rates declined slightly in December 2017 from their prior low the month before, then rose over the next 11 months before falling again in December 2018. The decline in contribution rates at the end of the year was more pronounced among O4s, whose contribution rates fell from September to December 2017 and in November and December 2018.

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[24] Due to typical promotion schedules, at most three Marines with fewer than 12 years of service held paygrade O5 in any given month, and none held paygrades O6 or higher.

[25] Although most of these differences likely represent promotion, aggregate data combined with the possibility of demotion do not let us say exactly how many.

Figure 17.   USMC TSP contribution rates by officer paygrade, eligible for the BRS, 2017–2018
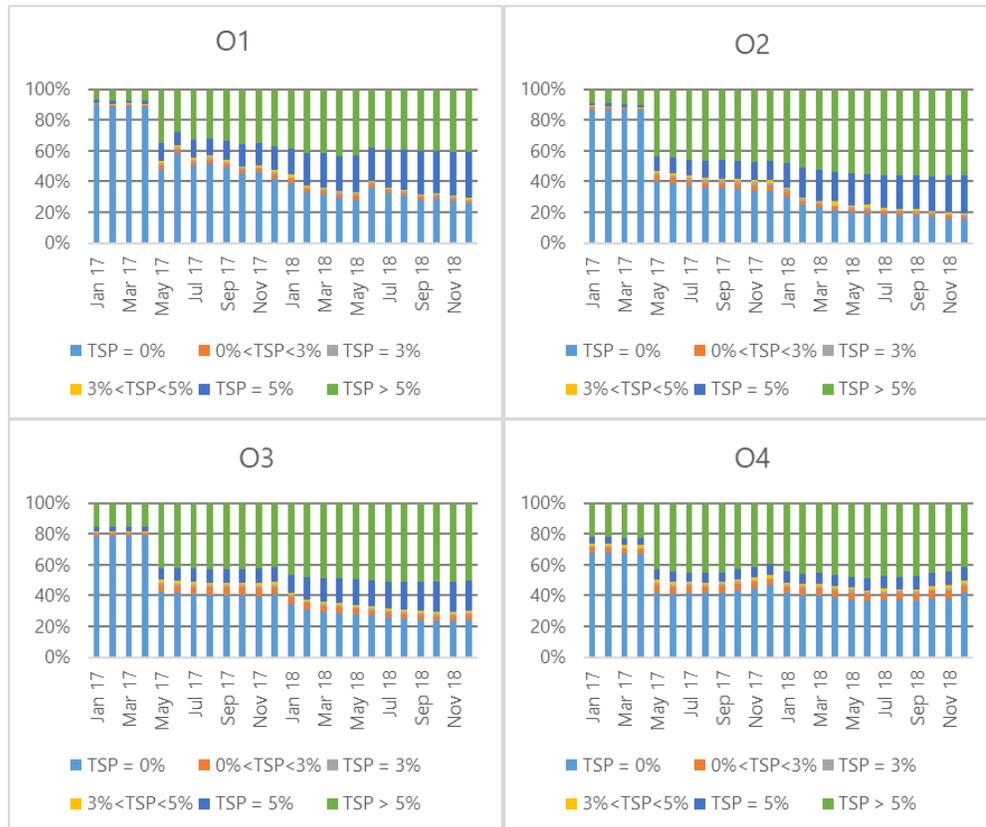
Notes: For O1s, sample sizes ranged from 2,231 (in May 2017) to 3,044 (in February 2018). For O2s, sample sizes ranged from 2,593 (in February 2018) to 3,161 (in May 2017). For O3s, sample sizes ranged from 4,240 (in October 2017) to 4,604 (in April 2018). For O1s, sample sizes ranged from 623 (in April 2018) to 887 (in October 2017).
Source: DMDC.

Figure 18 shows TSP contributions by paygrades O2 through O6 among ineligible Marines. In general, the probability of contributing to the TSP is negatively correlated with paygrade for ineligible Marine officers. Again, there is evidence of the elective deferral limit, even without the incentive of automatic or matching payments: for paygrades O4 and higher, the probability of contributing fell over the second half of each year, becoming more pronounced as paygrades rise. In each year, this decrease in contribution was most closely tied to an accompanying decrease in contributions of over 5 percent.

Figure 18.   USMC TSP contribution rates by officer paygrade, ineligible for the BRS, 2017–2018
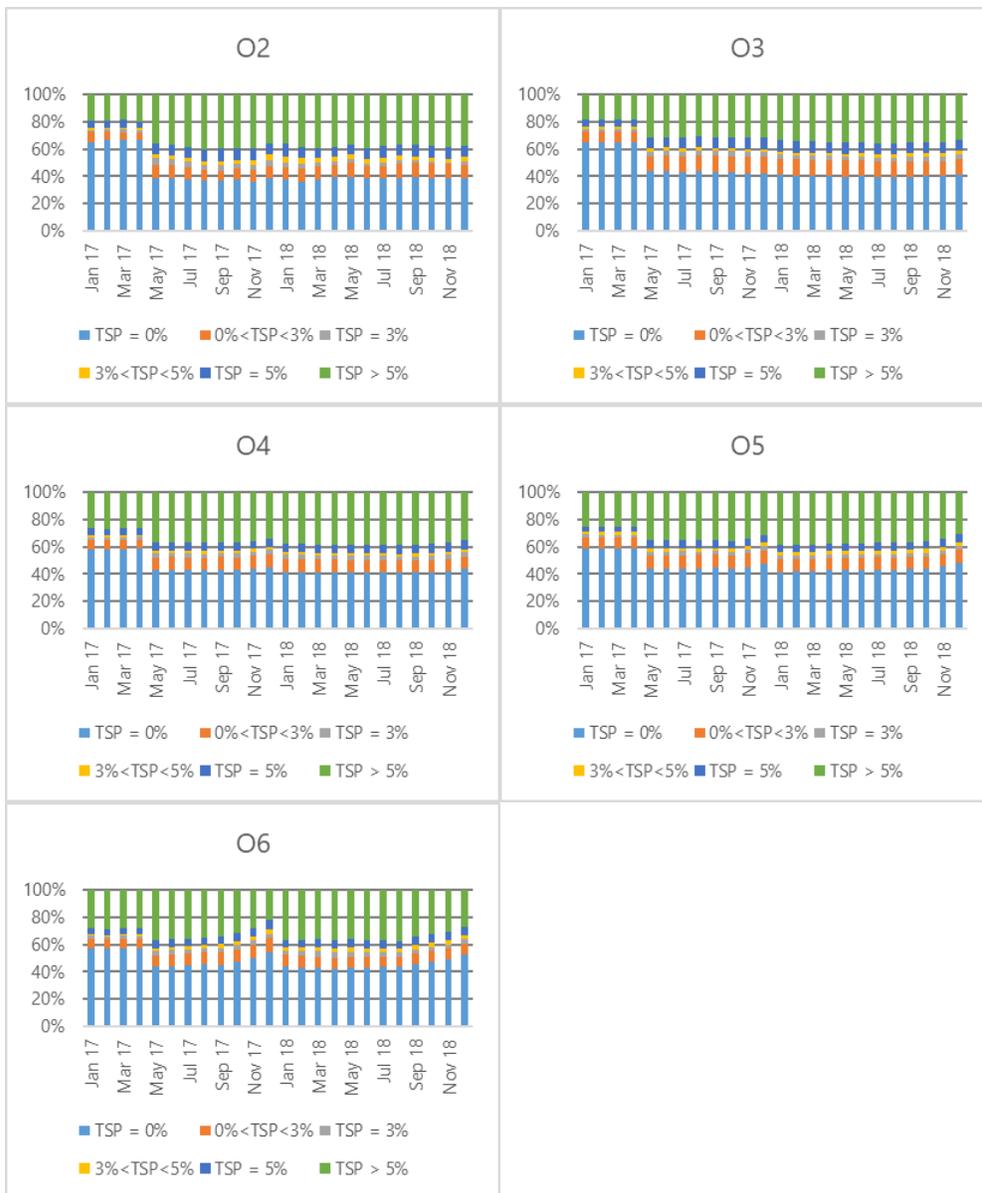
Notes: For O2s, sample sizes ranged from 157 (in October 2018) to 239 (in August 2018). For O3s, sample sizes ranged from 1,077 (in November 2017) to 1,185 (in April 2018). For O4s, sample sizes ranged from 2,593 (in December 2018) to 2,851 (in June 2017). For O5s, sample sizes ranged from 1,779 (in September 2017 and November 2018) to 1,795 (in March 2018). For O6s, sample sizes ranged from 605 (in June and July 2018) to 616 (in June 2018).
Source: DMDC.

USMC contributions by age and RMC

Figure 19 shows contribution rates by auto-enrolled Marines, separated into categories based on their 10-year age range *as of January 1, 2018*.[26] This means, for example, that a Marine whose birthday is January 2, 1998 will remain in the "younger than 20" category for the duration of our analysis, even though he or she turns 20 one day into our sample. Although Marines may enter and exit our sample entirely, they will not transfer across categories. Although Marines age 20–29 were much more likely to contribute to the TSP than those under 20, this may reflect different growth in the two samples. In 11 of 12 months, the under-20 sample grew at a higher rate than the 20–29 sample.[27] In particular, in July 2018, when the gap in TSP contribution widened, the 20–29 sample had grown by only 6.7 percent versus 33.3 percent for the under-20 sample. The difference in sample growth across age categories means a difference in the percentage of Marines without TSP accounts. However, despite continual growth in the under-20 category, the contribution gap narrowed noticeably in the last two months of 2018. In the second half of the year, once contribution patterns began to stabilize, Marines in the 20–29 age group were much more likely to contribute the default rate to the TSP than those in the under-20 age group. Through middle and late 2018, they were also more likely to contribute 5 percent or more, though the under-20 age group caught up in the final two months of the year.

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[26] DMDC data contained Marines' dates of birth, from which it was possible to manually compute age as of any given reference date. We chose January 1, 2018, since it was the date the policy went into effect.

[27] The exception was in May 2018, when the under-20 sample grew by 88.0 percent over the previous month and the 20–29 sample grew by 88.1 percent.

Figure 19. USMC TSP contribution rates by age, auto-enrollees, 2018
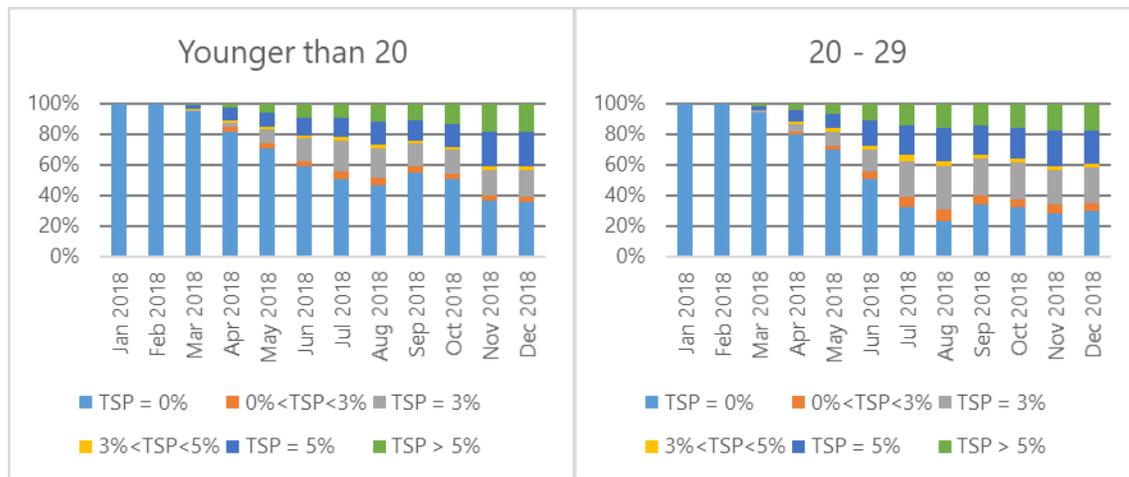

Notes: For Marines younger than 20, sample sizes ranged from 20 (in January) to 11,871 (in December). For Marines aged 20–29, sample sizes ranged from 40 (in January) to 3,678 (in December).
Source: DMDC.

Figure 20 shows that auto-enrollees earning less than $25,000 in RMC were much less likely than those earning higher levels of RMC to contribute to the TSP and, from June 2018 onward, were less likely to appear in nearly every contribution category than Marines earning between $25,000 and $49,999.[28] As discussed in the body of the paper, this could reflect the desire for a threshold income level prior to saving, or could reflect correlation with qualifying for BAH.

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[28] In July 2018, Marines earning between $25,000 and $49,999 were 0.4 percentage points less likely than those earning less than $25,000 to contribute between 3 and 5 percent.

Figure 20. USMC TSP contribution rates by total gross annual income, auto-enrollees, 2017–2018
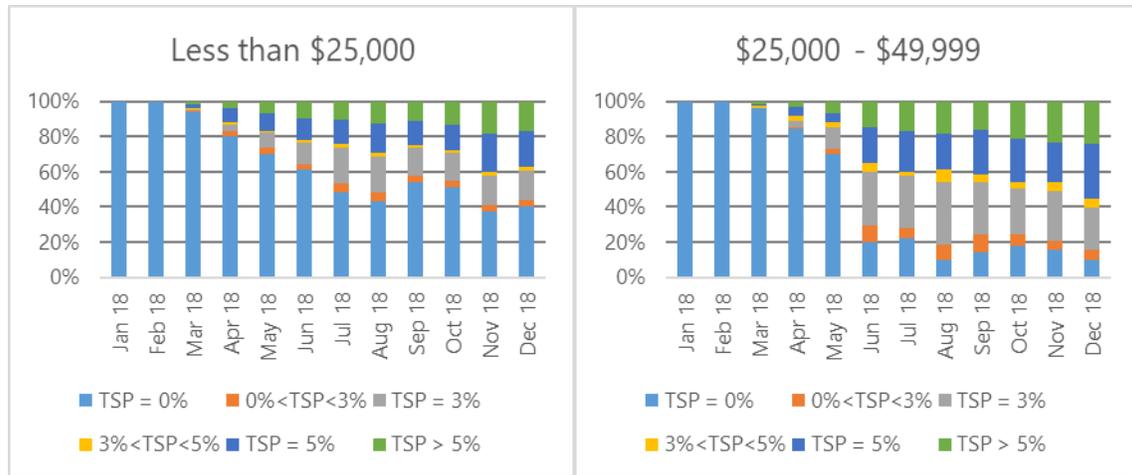
Notes: For Marines earning less than $25,000, sample sizes ranged from 59 (in January) to 12,329 (in December). For Marines earning $25,000–$49,999, sample sizes ranged from 1 (in January) to 3,007 (in December).
Source: DMDC.

Figure 21 shows mixed trends in TSP contribution rates by age group among eligible Marines. Though eligible Marines younger than 20 were contributing at much lower rates than those aged 20–29 or 30–39 well into 2017, their probability of contributing rose steadily in the second half of 2017 and all of 2018, and they were the group most likely to contribute in November and December 2018. This corresponds to steady (if uneven) growth in the probability of contributing 5 percent or more during this time, including a rapid and simultaneous decrease in the probability of contributing between 3 and 5 percent and increase in the probability of contributing 5 percent in February of 2018. The 20–29 age group and 30–39 age group also showed steady (though more gradual) increases in the probability of contributing to the TSP, each driven by growth in the number of Marines contributing 5 percent or more.

Figure 21. USMC TSP contribution rates by age, eligible for the BRS, 2017–2018
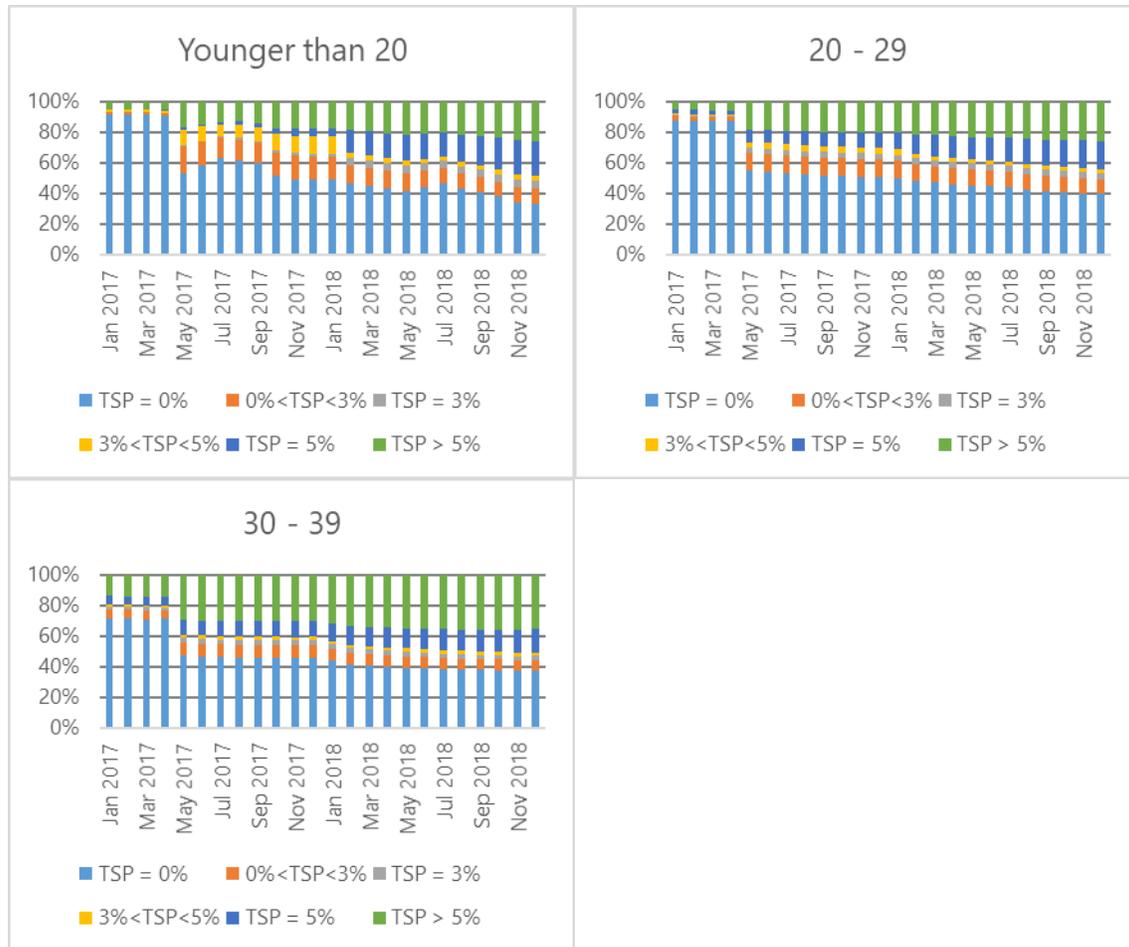
Notes: For Marines younger than 20, sample sizes ranged from 9,407 (in January 2017) to 36,225 (in November 2018). For Marines aged 20–29, sample sizes ranged from 96,387 (in December 2018) to 128,815 (in January 2017). For Marines aged 30–39, sample sizes ranged from 6,808 (in December 2018) to 13,827 (in January 2017).
Source: DMDC.

Figure 22 shows that, for eligible Marines earning less than $125,000, RMC levels were positively correlated with both the probability of making any TSP contribution and the probability of contributing over 5 percent. However, eligible Marines earning between $125,000 and $149,999 were less likely to contribute to the TSP or to contribute over 5 percent than those earning between $100,000 and $124,999. They also were the least likely group to contribute 5 percent during all months of 2018. Beginning in February 2018, eligible Marines

who earned less than $25,000 were the most likely to contribute 3 percent, 5 percent, or any amount in between. Some Marines earning less than $25,000 also appear to have noticeably increased their TSP contributions once the BRS was implemented, perhaps because they required some form of matching to justify a reduction in their already-low gross incomes. Among eligible Marines earning over $100,000, contribution patterns again appear to reflect reaching the elective deferral limit.

Figure 22. USMC TSP contribution rates by total gross annual income, eligible for the BRS, 2017–2018
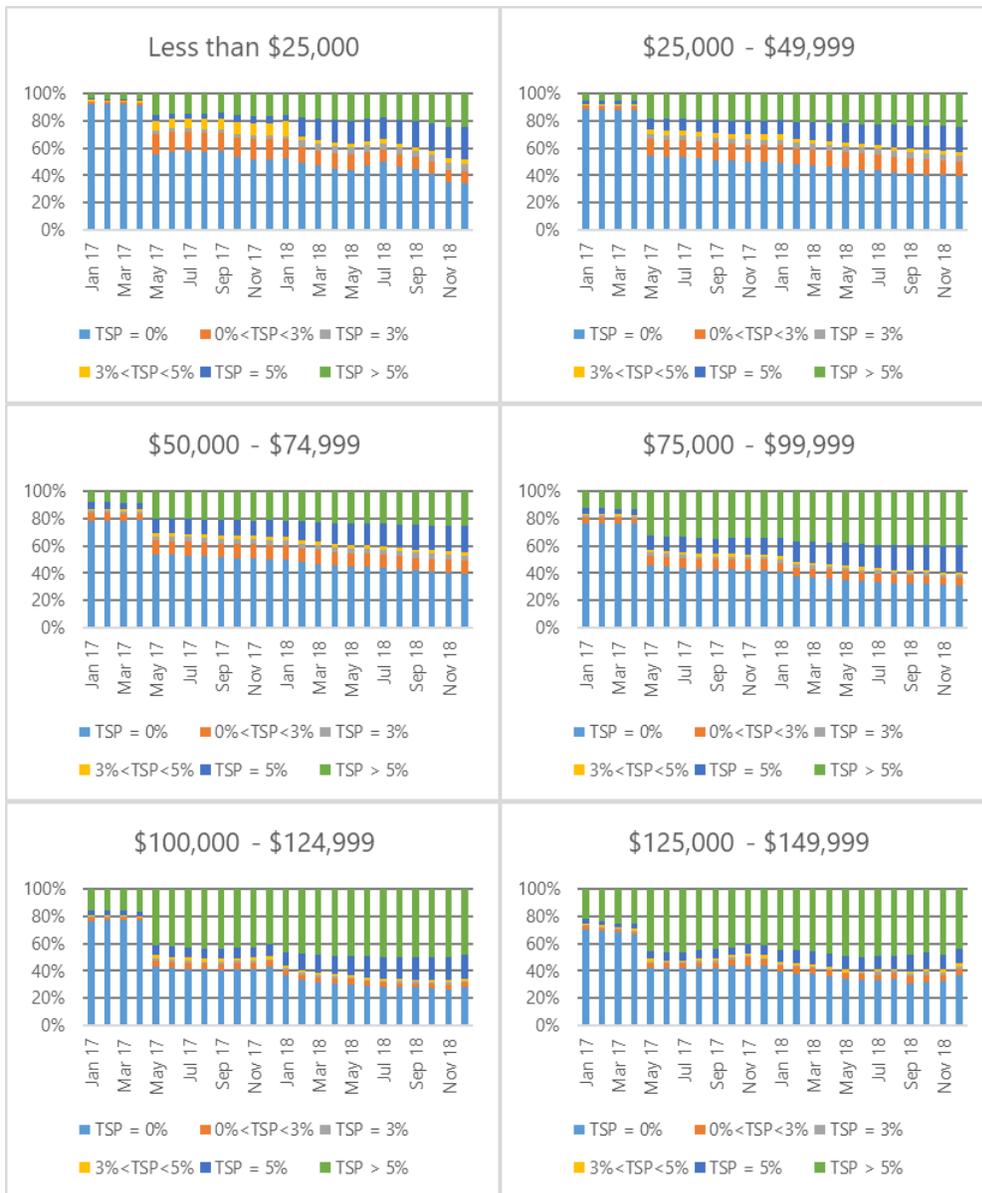
Notes: Between 23,675 (December 2018) and 42,539 (December 2017) Marines earned less than $25,000. Between 65,394 (August 2017) and 78,824 (January 2018) Marines earned $25,000–$49,999. Between 32,565 (November 2017) and 34,217 (May 2018) Marines earned $50,000–$74,999. Between 7,815 (November 2017) and 8,779 (July 2018) Marines earned $75,000–$99,999. Between 2,803 (September 2017) and 3,157 (February 2018) Marines earned $100,000–$124,999. Between 388 (April 2017) and 546 (March 2018) Marines earned $125,000–$149,999. Source: DMDC.

Figure 23 shows that TSP contribution rates are positively correlated with age among ineligible Marines. For ineligible Marines under age 50 as of January 2018, contributions remain extremely steady starting in May 2017—the share contributing at all and the share contributing over 5 percent always remain within 3 percentage points of their values in May 2017, and other contribution categories are even more stable. Ineligible Marines age 50 and older in January 2018 instead appeared increasingly likely to reach the elective deferral limit over the course of each year.

Figure 23. USMC TSP contribution rates by age, ineligible for the BRS, 2017–2018
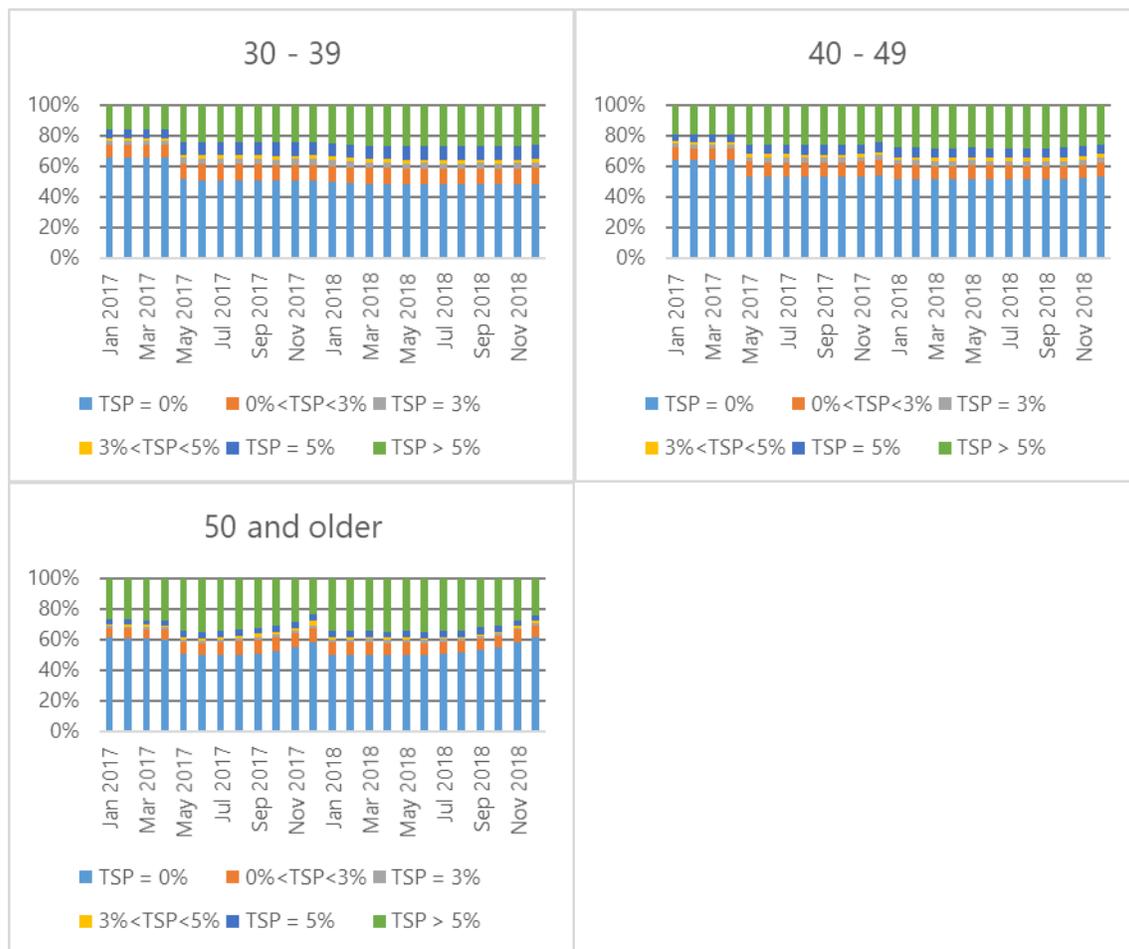
Notes: For Marines aged 30–39, sample sizes ranged from 15,365 (in January 2017) to 17,531 (in November 2018). For Marines aged 40–49, sample sizes ranged from 6,048 (in December 2018) to 8,841 (in January 2017). For Marines aged 50 or older, sample sizes ranged from 410 (in December 2018) to 7525 (in January 2017). Source: DMDC.

Figure 24 shows three distinct patterns for ineligible Marines based on their RMC levels. Ineligible Marines earning under $100,000 gradually became more likely to contribute to the TSP between May 2017 and December 2018; those earning $100,000 to $124,999 had extremely stable contribution levels over this time; and those earning $125,000 or more became less likely to contribute to the TSP over the second half of each year, with the decrease in contribution rates becoming more pronounced as RMC rises. This again is likely to reflect hitting the TSP contribution limit.

Figure 24. USMC TSP contribution rates by total gross annual income, ineligible for the BRS, 2017–2018
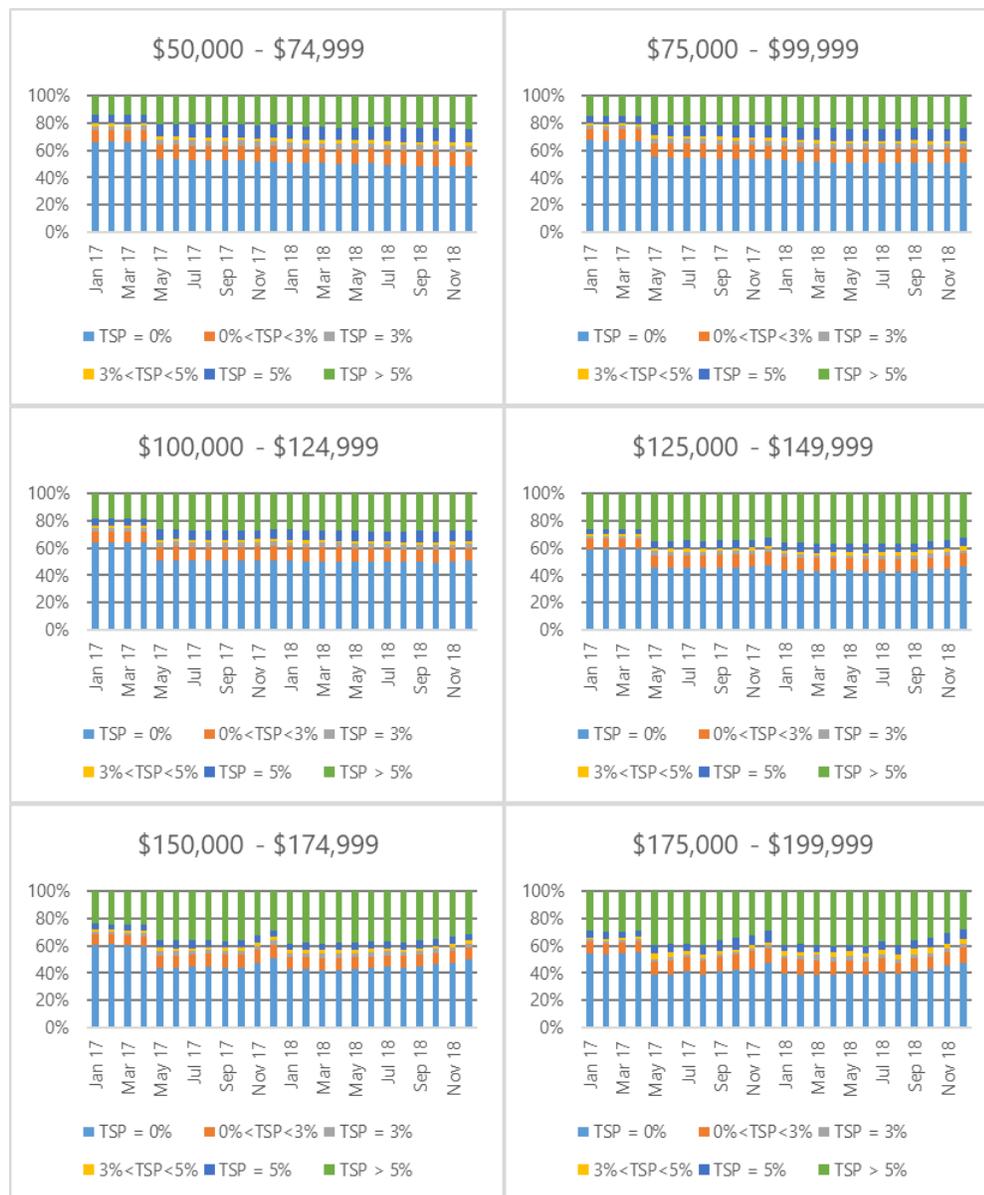
Notes: Between 4,964 (August 2018) and 5,877 (November 2017) Marines earned $50,000–$74,999. Between 9,329 (December 2017) and 9,869 (June 2018) Marines earned $75,000–$99,999. Between 4,774 (November 2018) and 5,271 (July 2017) Marines earned $100,000–$124,999. Between 2,940 (October 2017) and 3,298 (July 2018) Marines earned $125,000–$149,999. Between 1,121 (November 2017) and 1,371 (May 2018) Marines earned $150,000-$174,000. Between 322 (February 2017) and 408 (March 2018) Marines earned $175,000-$199,999.
Source: DMDC.

USMC contribution rates by gender, race, and Hispanic ethnicity

Gender

Figure 25 shows that female enrollees were slightly more likely to contribute to the TSP in the second half of 2018 (patterns earlier in the year may reflect small sample sizes). However, the percent of basic pay contributed varied by gender. Beginning in April 2018, female Marines were more likely than male Marines in each month to select a non-default contribution rate below 5 percent; in six of these nine months, they also were more likely to contribute exactly 5 percent. However, male Marines were consistently more likely than female Marines to contribute over 5 percent to the TSP.[29]

**Figure 25. USMC TSP contribution rates by gender, auto-enrollees, 2018**
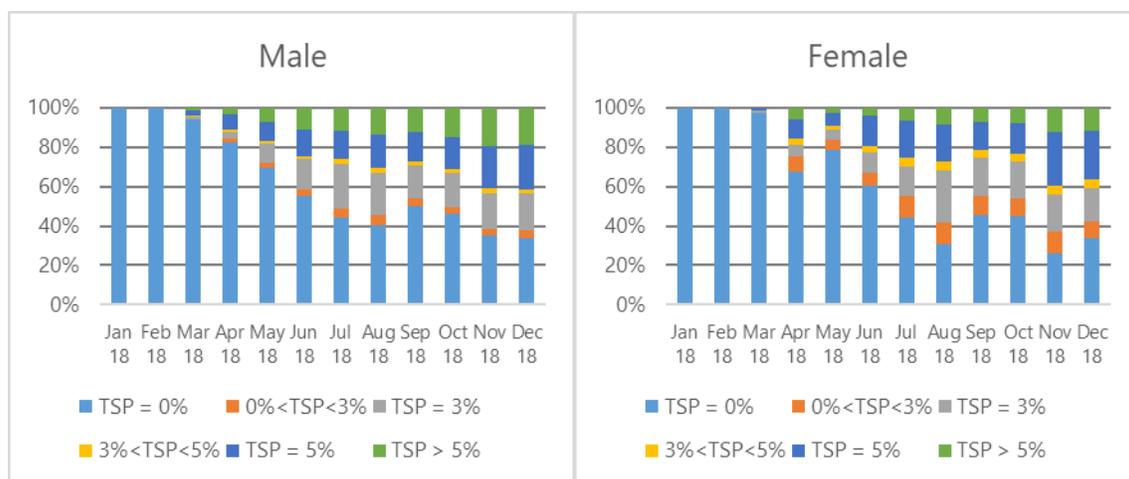
Notes: For men, sample sizes ranged from 56 (in January) to 14,002 (in December). For women, sample sizes ranged from 4 (in January) to 1,556 (in December).
Source: DMDC.

Figure 26 shows that, starting in May 2017, female Marines who would become eligible for the BRS were much more likely than their male counterparts to contribute to the TSP. After four months in which male and female Marines were almost equally likely to contribute to the TSP, female Marines were over 12 percentage points more likely to contribute in every subsequent

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[29] The exceptions to this were in January and February, during which no Marines contributed to TSP, and in April, during which only 56 male Marines and 263 male Marines contributed to TSPs.

month. This gap was driven chiefly by women contributing between 1 and 3 percent of their basic pay. In every month, female Marines were more likely to contribute exactly 3 percent of their basic pay, while male Marines were more likely to contribute over 5 percent. Beginning in January 2018, female Marines became more likely than male Marines to contribute between 3 and 5 percent, after achieving this only once in the prior 12 months. Although men were more likely to contribute 5 percent in every month through June 2018, women were more likely to do so in four of the six subsequent months.

Figure 26. USMC TSP contribution rates by gender, eligible for the BRS, 2017–2018
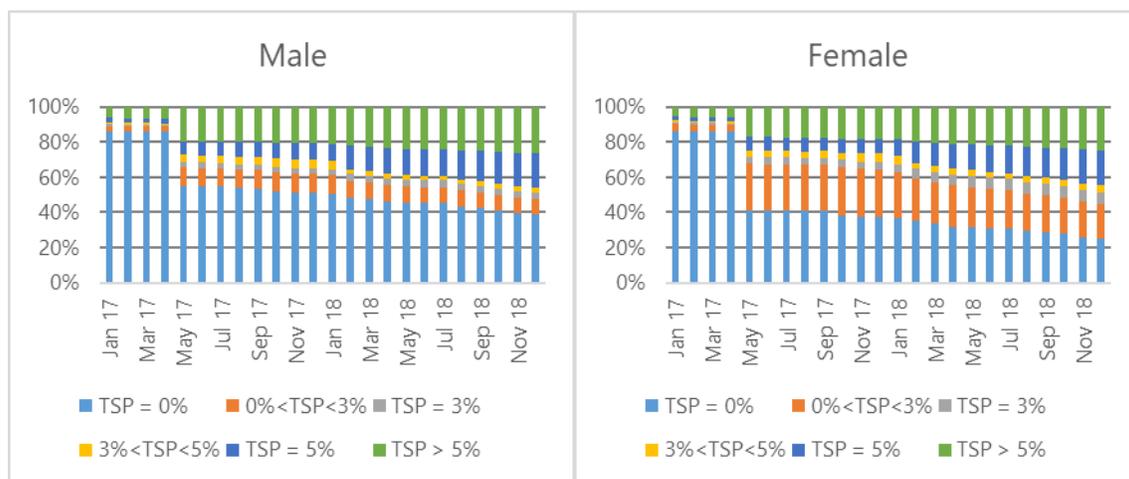
Notes: For men, sample sizes ranged from 126,922 (in December 2018) to 139,916 (in January 2018). For women, sample sizes ranged from 12,456 (in December 2018) to 13,526 (in February 2018).
Source: DMDC.

Figure 27 shows that female Marines who were ineligible to enroll in the BRS were much more likely than their male counterparts to contribute to the TSP. Unlike auto-enrollees and Marines who were eligible for the BRS, female Marines who were ineligible for the BRS were more likely than men to contribute 5 percent or more of their basic pay in every month (or to contribute the default rate of 3 percent) and less likely to contribute between 0 and 3 percent. Male Marines generally were more likely to contribute between 3 and 5 percent.

Figure 27. USMC TSP contribution rates by gender, ineligible for the BRS, 2017–2018
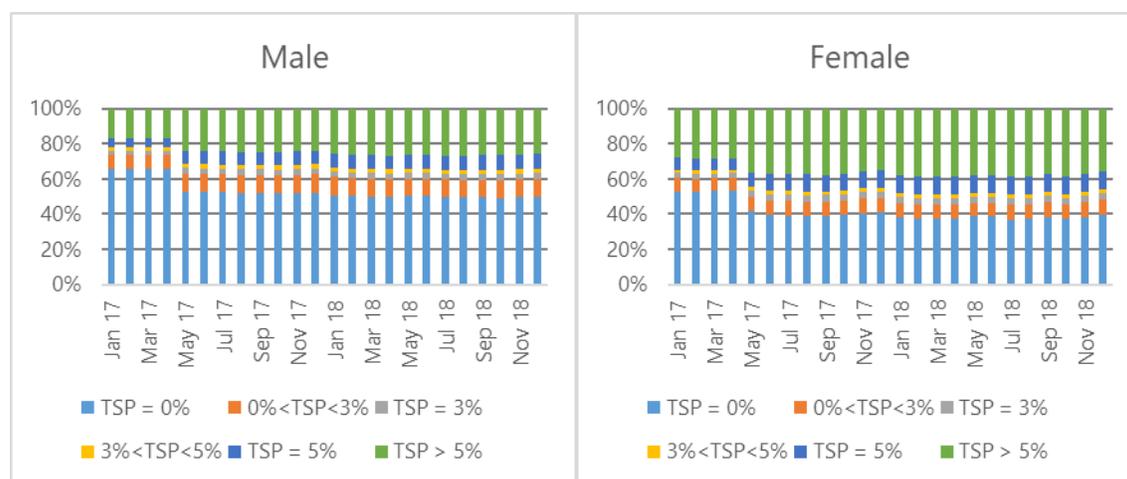
Notes: For men, sample sizes ranged from 23,244 (in December 2018) to 23,987 (in May 2017). For women, sample sizes ranged from 1,236 (in April 2017) to 1,327 (in June 2018).
Source: DMDC.

Race and Hispanic ethnicity

We examined race and Hispanic ethnicity separately. For race, we used the categorizations of American Indian/Alaska Native (AI/AN), Asian, Black, Native Hawai'ian/Pacific Islander (NH/PI), White, or two or more of the above, regardless of Hispanic status. We then treated Hispanic status as a binary category, regardless of race. Figure 28 and Figure 29 show TSP contribution rates by race and Hispanic ethnicity for auto-enrolled Marines. Figure 30 and Figure 31 show contributions for Marines who were eligible for the BRS (or would have been eligible had the BRS existed in 2017). Figure 32 and Figure 33 show TSP contribution rates for Marines who were ineligible for the BRS (or would have been ineligible had it existed in 2017).

Figure 28 shows that in December 2018, between 65 and 69 percent of auto-enrollees in all racial groups contributed to the TSP.[30] In this month, AI/AN auto-enrollees were the most likely to make any contribution or to contribute over 5 percent of their basic pay. NH/PI auto-enrollees were the least likely to contribute and the most likely to contribute the default rate of 3 percent. White auto-enrollees were the most likely to contribute 5 percent, and Black auto-enrollees were the most likely to contribute amounts below 5 percent other than the default.

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[30] We omit a sub-graph for auto-enrolled Marines belonging to two or more races, since this category never contained more than 15 Marines. Because there were fewer than 200 AI/AN or NH/PI and fewer than 500 Asian auto-enrolled Marines in any month in 2018, results for these groups should also be treated with caution.

Figure 28. USMC TSP contribution rates by race, auto-enrollees, 2018
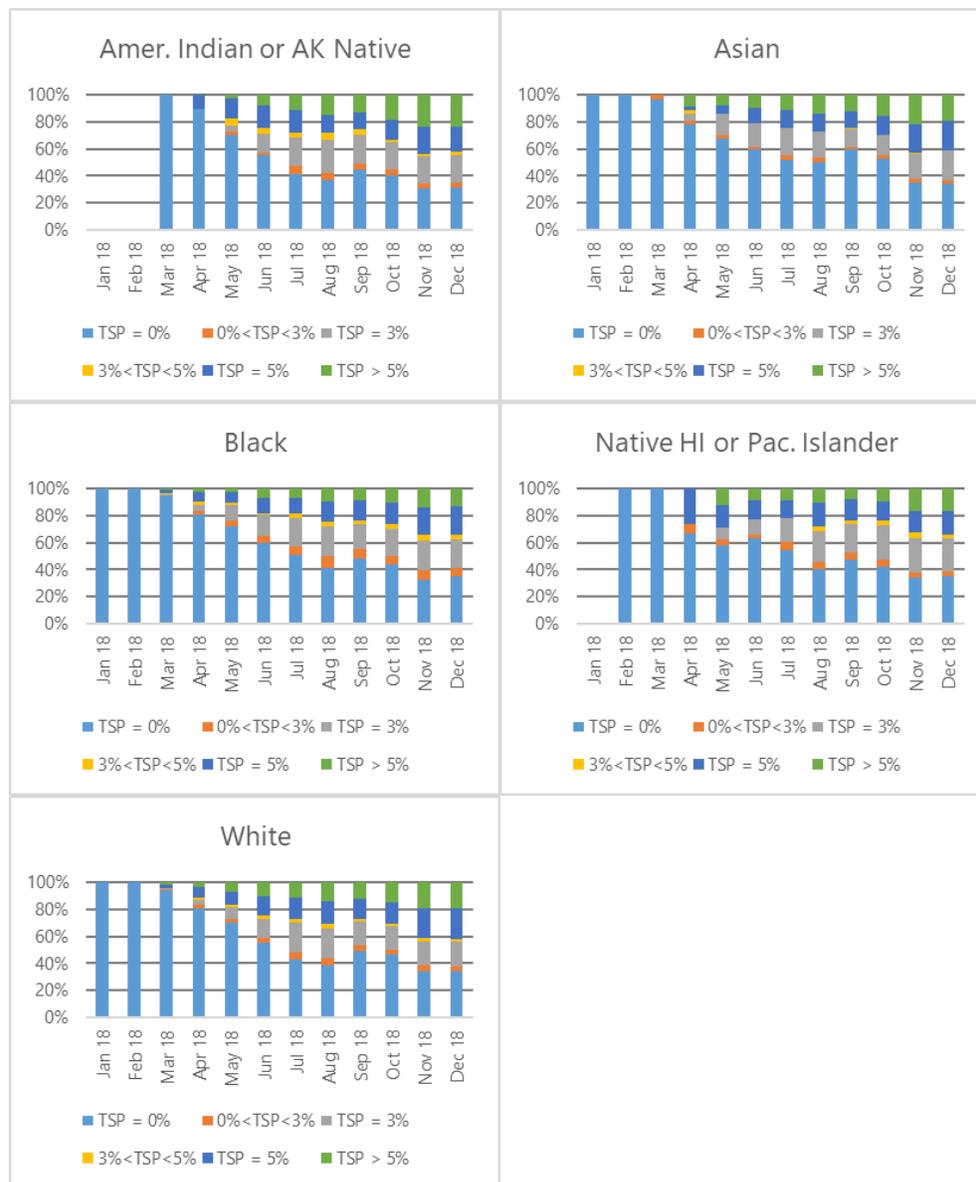
Notes: For AI/AN Marines, sample sizes ranged from 15 (in March) to 160 (in December). For Asian Marines, sample sizes ranged from 4 (in January) to 459 (in December). For Black Marines, sample sizes ranged from 5 (in January) to 1,773 (in December). For NH/PI Marines, sample sizes ranged from 1 (in February) to 137 (in December). For White Marines, sample sizes ranged from 51 (in January) to 13,014 (in December).
Source: DMDC.

Figure 29 shows that Hispanic and non-Hispanic auto-enrollees were similarly likely to contribute to the TSP over the course of 2018. In general, Hispanic auto-enrollees were more

likely than non-Hispanic auto-enrollees to contribute 3 percent and less likely to contribute 5 percent. Probabilities of contributing other rates were similar across all months.

Figure 29. USMC TSP contribution rates by Hispanic ethnicity, auto-enrollees, 2018
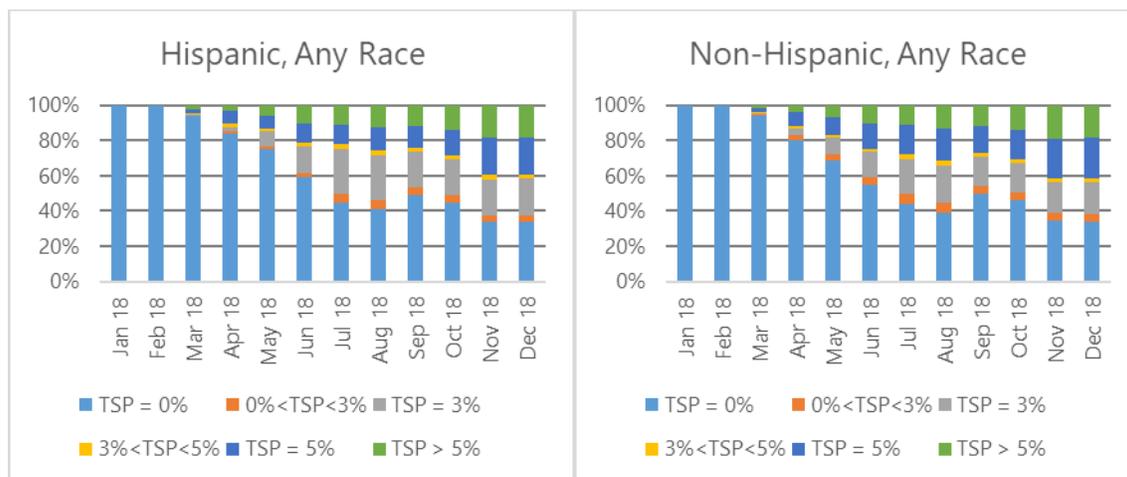
Notes: Among Hispanic Marines, sample sizes ranged from 10 (in January) to 3,889 (in December). Among non-Hispanic Marines, sample sizes ranged from 50 (in January) to 11,669 (in December).
Source: DMDC.

Figure 30 shows contribution patterns by race for Marines eligible for the BRS. In every month through September 2018, multiracial eligible Marines were the most likely to contribute to the TSP; in the final three months of 2018, Asian eligible Marines were the most likely to do so. For nearly all of the two years we observed, AI/AN eligible Marines were the least likely to contribute to the TSP. Over all of 2017 and 2018, Black eligible Marines were the least likely group to contribute 5 percent or more to the TSP; beginning in May 2017, they were frequently the most likely group to contribute 3 percent or less, and for much of 2018 they were the most likely group to contribute any amount below 5 percent.

Figure 30. USMC TSP contribution rates by race, eligible for the BRS, 2017–2018
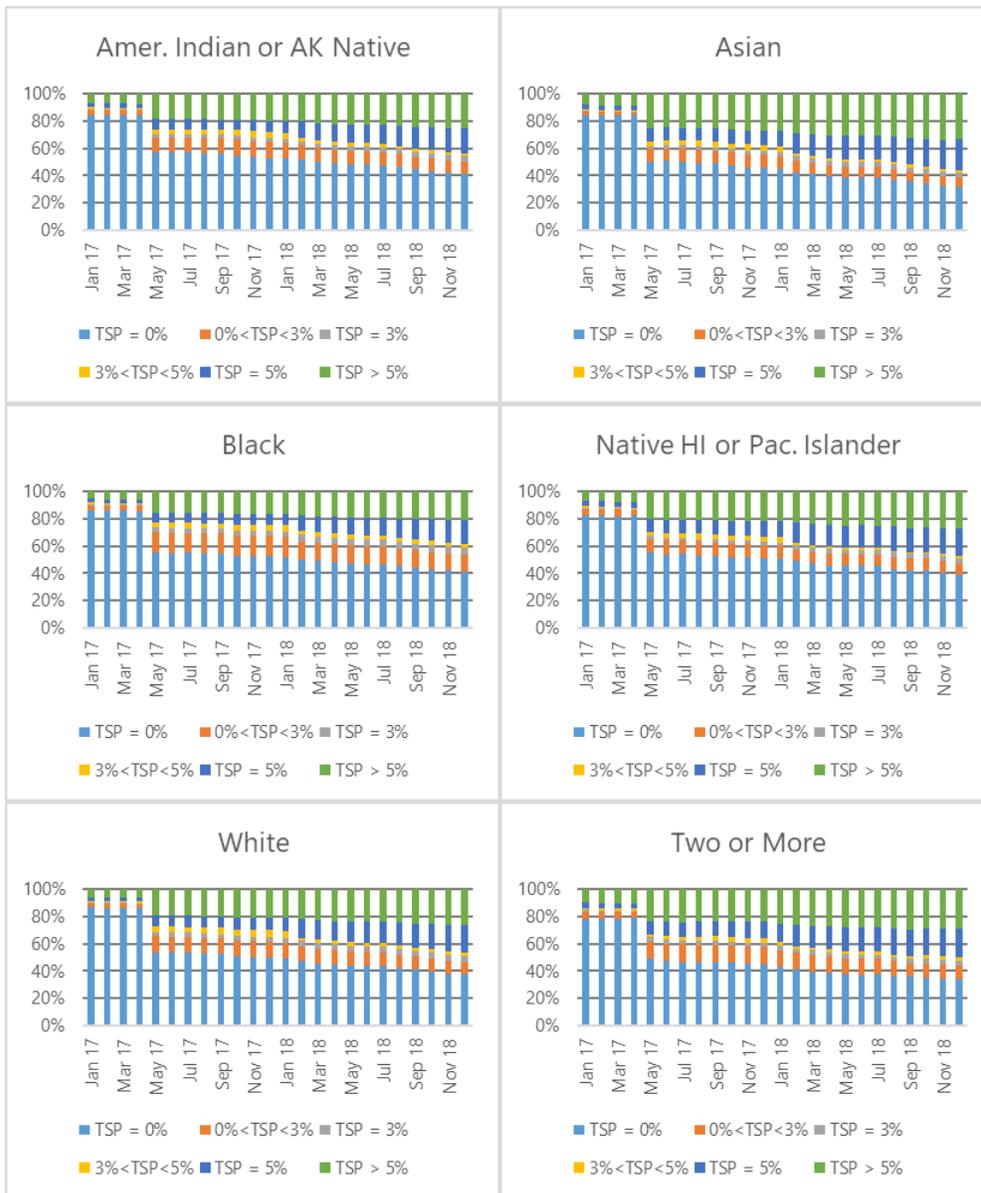
Notes: For AI/AN Marines, sample sizes ranged from 1,466 (December 2018) to 1,631 (January 2018). For Asian Marines, sample sizes ranged from 4,321 (December 2018) to 4,630 (January 2018). For Black Marines, sample sizes ranged from 14,454 (December 2018) to 16,382 (January 2018). For NH/PI Marines, sample sizes ranged from 1,595 (December 2018) to 1,775 (March 2017). For White Marines, sample sizes ranged from 115,926 (December 2018) to 127,532 (January 2018). For Marines of two or more races, sample sizes ranged from 1,403 (September and October 2017) to 1,616 (December 2018).
Source: DMDC.

As Figure 31 shows, beginning in May 2017, non-Hispanic eligible Marines were between 3.0 and 4.2 percentage points more likely than Hispanic Marines to contribute to the TSP and between 3.0 and 4.3 percentage points more likely to contribute 5 percent. Differences across other contribution categories were small—at most 0.6 percentage points.

Figure 31. USMC TSP contribution rates by Hispanic ethnicity, eligible for the BRS, 2017–2018
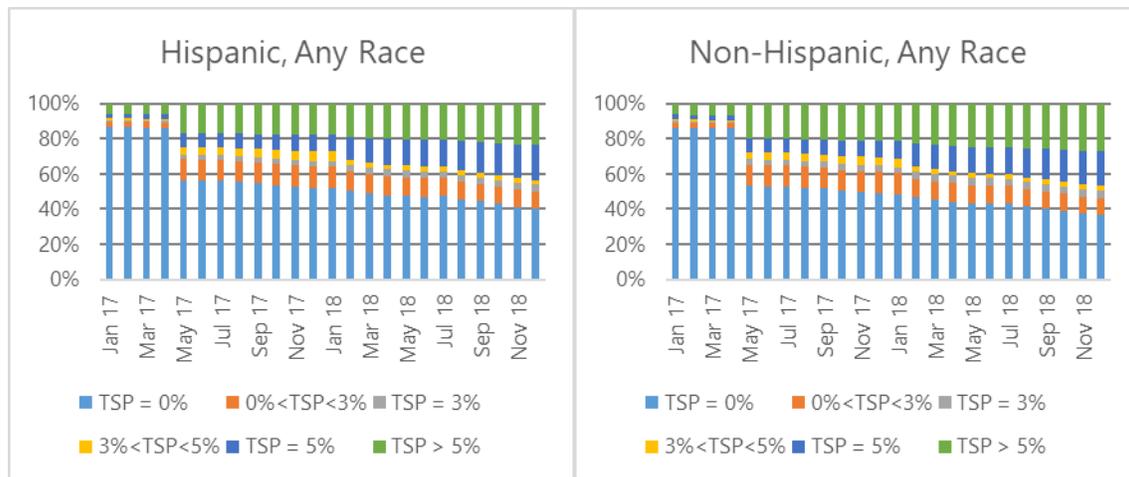
Notes: Among Hispanic Marines, sample sizes ranged from 30,331 (in January 2017) to 32,574 (in February 2018). Among non-Hispanic Marines, sample sizes ranged from 108,680 (in December 2018) to 121,820 (in January 2017).
Source: DMDC.

Figure 32 shows that among those ineligible for the BRS, Asian Marines were the most likely to contribute to the TSP in every month from May 2017 onward, while Black Marines were the least likely. Asian ineligible Marines also were by far the most likely to contribute over 5 percent; the next-closest group never came closer than 8 percentage points. AI/AN, Black, and NH/PI ineligible Marines were the least likely groups to contribute over 5 percent; in any given month from May 2017 onward, one of these groups was the least likely contribute this amount, and differences between the three groups only infrequently exceeded 1 percentage point.

Figure 32. USMC TSP contribution rates by race, ineligible for the BRS, 2017–2018
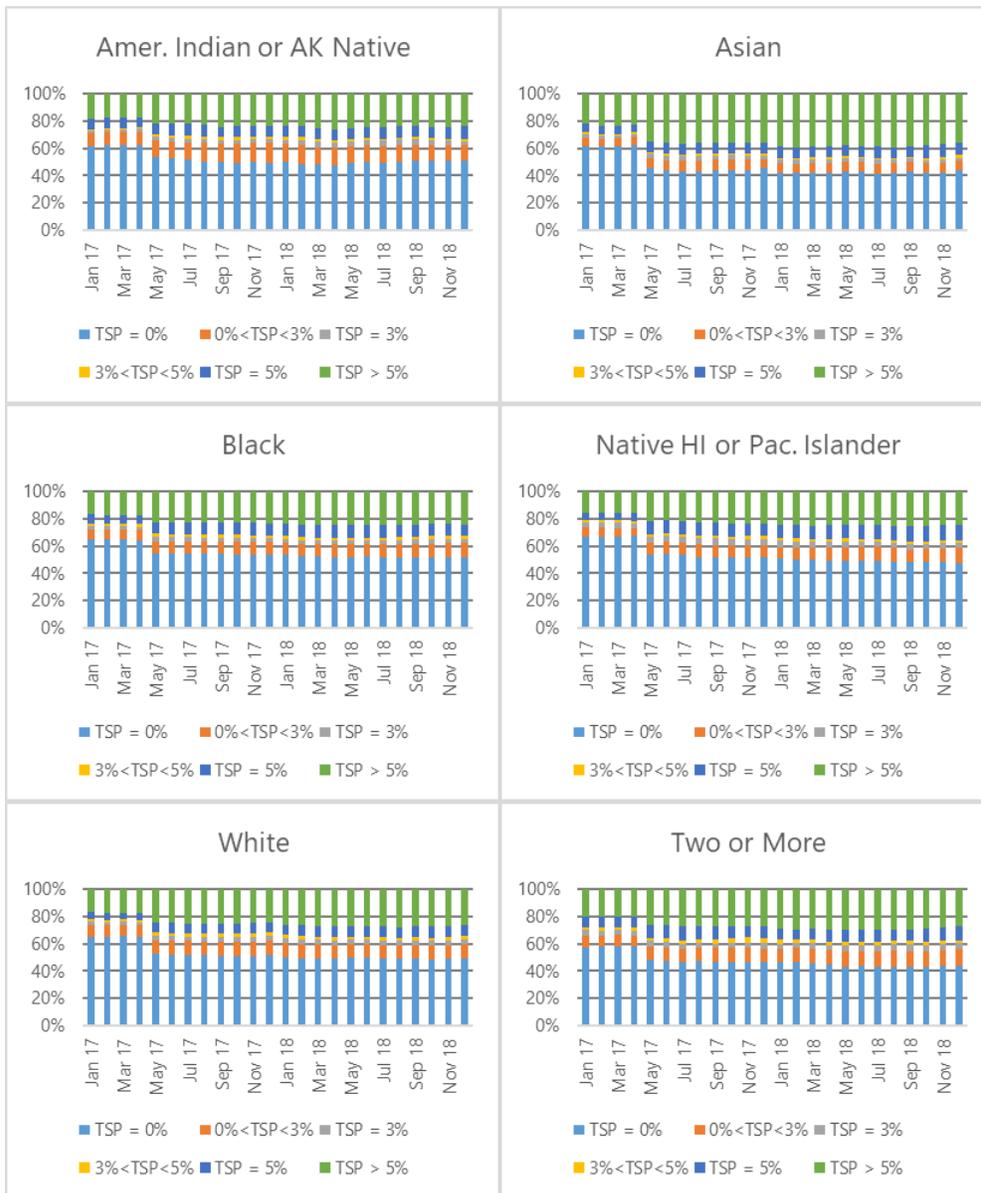
Notes: For AI/AN Marines, sample sizes ranged from 297 (in December 2018) to 322 (in January 2018). For Asian Marines, sample sizes ranged from 704 (in March 2017) to 743 (in September 2018). For Black Marines, sample sizes ranged from 3,207 (in December 2018) to 3,584 (in January 2018). For NH/PI Marines, sample sizes ranged from 244 (in January 2017) to 264 (in November 2018). For White Marines, sample sizes ranged from 19,551 (in December 2018) to 20,120 (in June 2018). For Marines of two or more races, sample sizes ranged from 414 (in January 2017) to 472 (in December 2018).
Source: DMDC.

Figure 33 shows that ineligible Marines contributed to the TSP at very similar rates regardless of Hispanic ethnicity. In no month were differences in any contribution category greater than 1.5 percentage points.

Figure 33. USMC TSP contribution rates by Hispanic ethnicity, ineligible for the BRS, 2017–2018
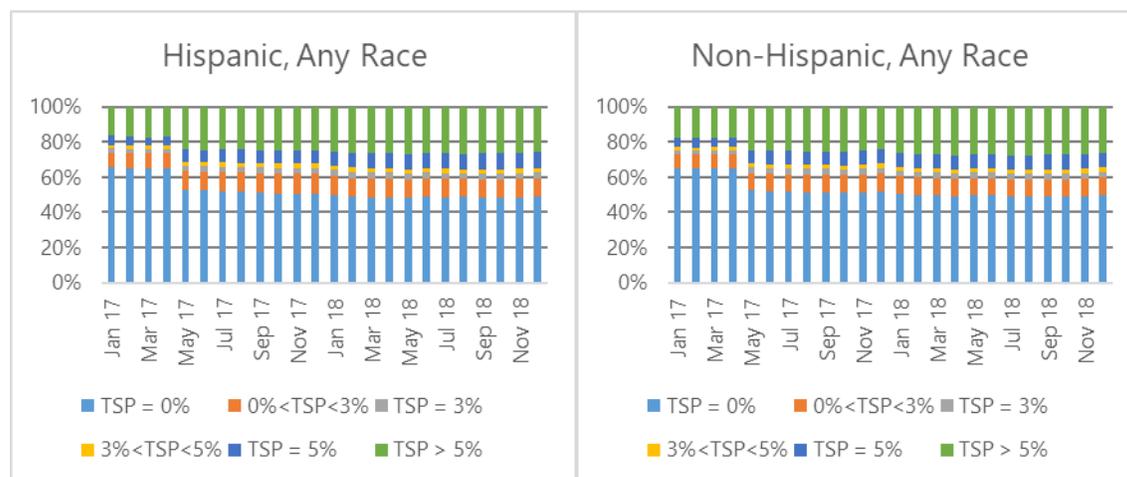
Notes: Among Hispanic Marines, sample sizes ranged from 3,065 (in April 2017) to 3,174 (in June 2018). Among non-Hispanic Marines, sample sizes ranged from 21,400 (in December 2018) to 22,154 (in May 2017). Source: DMDC.

While we observe differences in contribution rates by gender and by race (though not by Hispanic ethnicity), we urge caution in interpreting these results for two primary reasons. First, increasing diversity in the Marine Corps may mean that female and/or minority Marines have different average paygrades, YOS, income levels, or other factors that directly or indirectly affect contribution levels. Second, race and gender may interact in unexpected ways—for example, among ineligible Marines, Black women are more likely than AI/AN women to contribute to the TSP or to contribute at least 5 percent, but AI/AN men are more likely than Black men to do either.

Army, Navy, and Air Force TSP contributions by age

Auto-enrollees

Figure 34, Figure 35, and Figure 36 respectively show how auto-enrolled Soldiers, Sailors, and Airmen contributed to the TSP by age.[31] For auto-enrolled Soldiers, age is positively correlated with selecting contribution values other than 3 percent, though differences are most visible for contributions above 3 percent. However, a clear majority still contribute 3 percent. Among auto-enrolled Sailors, neither age group is consistently more likely than the other to appear in a given contribution category. However, some patterns hold across both age groups. Auto-enrolled Sailors from each age group are less likely to contribute 3 percent and more likely to contribute more than 5 percent over the year, with a large change in these probabilities towards the end of the year. Auto-enrolled Airmen behave more similarly to Soldiers than Sailors, since they are extremely likely to make the default TSP contribution of 3 percent. However, Airmen aged 20–29 were more likely than Soldiers to contribute higher amounts.

Figure 34. Army TSP contribution rates by age, auto-enrollees, 2018
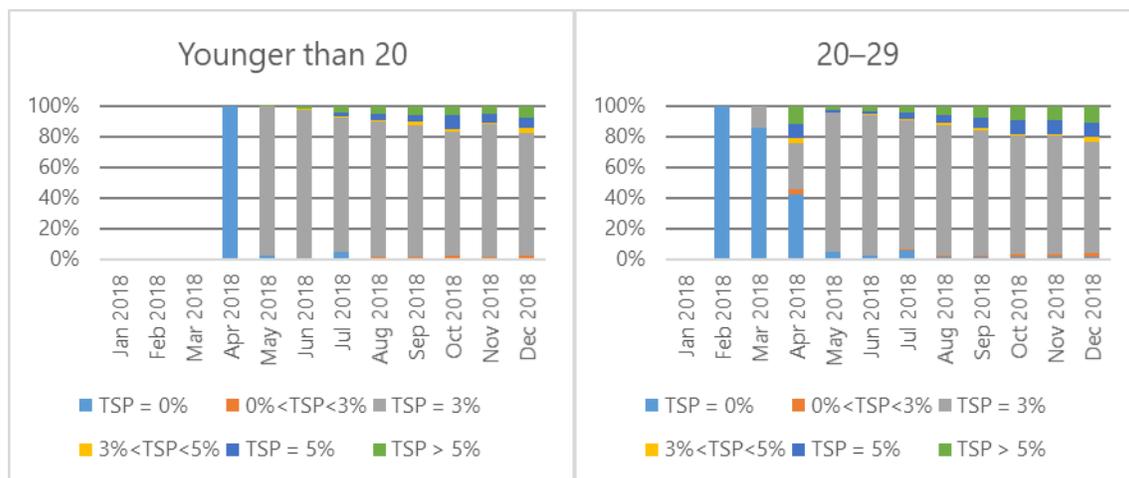
Notes: Sample sizes for Soldiers younger than 20 ranged from 1 (in April) to 11,723 (in December). Sample sizes for Soldiers aged 20–29 ranged from 2 (in February) to 16,507 (in December).
Source: TSP.

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[31] We omit graphs for auto-enrollees aged 30 and above due to small sample sizes.

Figure 35. Navy TSP contribution rates by age, auto-enrollees, 2018
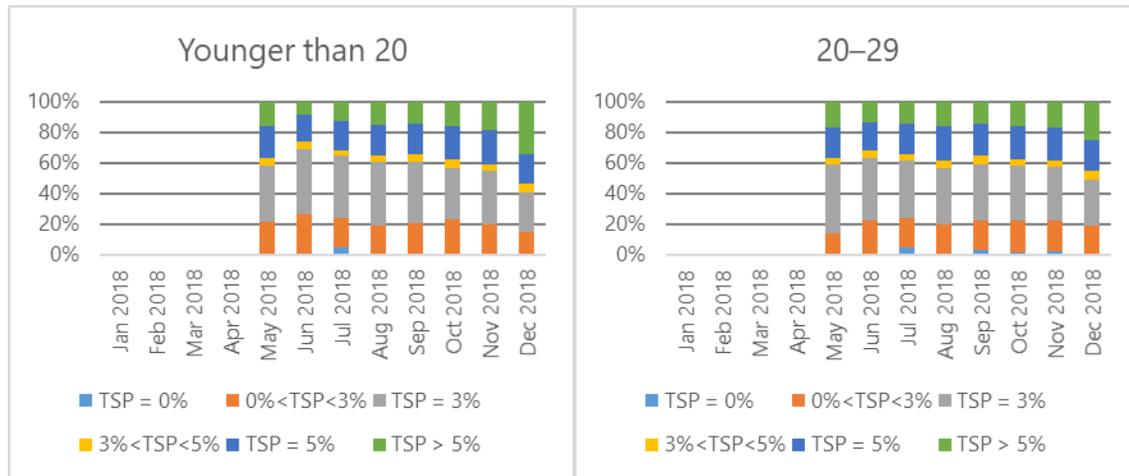
Notes: Sample sizes for Sailors younger than 20 ranged from 62 (in May) to 12,160 (in December). Sample sizes for Sailors aged 20–29 ranged from 102 (in May) to 11,415 (in December).
Source: TSP.

Figure 36. Air Force TSP contribution rates by age, auto-enrollees, 2018
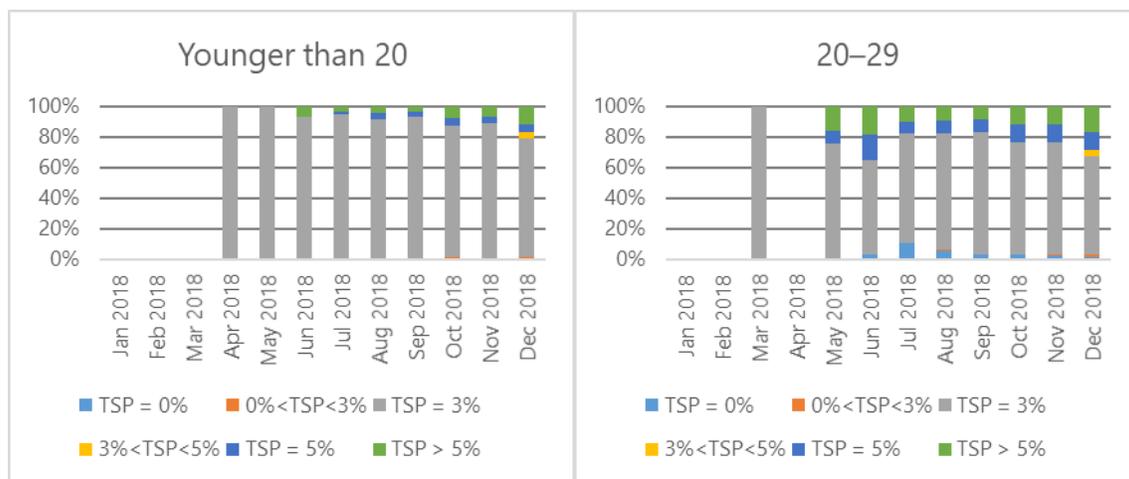
Notes: Sample sizes for Airmen younger than 20 ranged from 1 (in April) to 3,420 (in December). Sample sizes for Airmen aged 20–29 ranged from 1 (in March) to 5,885 (in December).
Source: TSP.

Opt-ins

Figure 37, Figure 38, and Figure 39 respectively show how TSP contribution rates varied by age for Soldiers, Sailors, and Airmen who opted in to the BRS.[32] In all three figures, age is positively correlated with the probability of contributing 5 percent or more than 5 percent and negatively correlated with the probability of contributing nothing. Opt-ins of all age groups were far less likely than auto-enrollees of either age group above to contribute the default of 3 percent, regardless of Service. As with opt-ins overall, contribution patterns among all age groups remained relatively stable from March 2018 onward. Soldiers younger than 20 who opted in had the greatest variation in contribution patterns across Services and age groups; this may reflect that even though there are more Soldiers under age 20 than Sailors or Airmen, fewer Soldiers under age 20 opted in to the BRS than Sailors or Airmen. Across all age groups, Soldiers were less likely than Sailors or Airmen to contribute over 5 percent; Soldiers younger than 40 also were more likely than Sailors or Airmen to contribute nothing.

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[32] In each figure, we omit those aged 50 and above due to small sample sizes.

Figure 37. Army TSP contribution rates by age, opt-ins, 2018
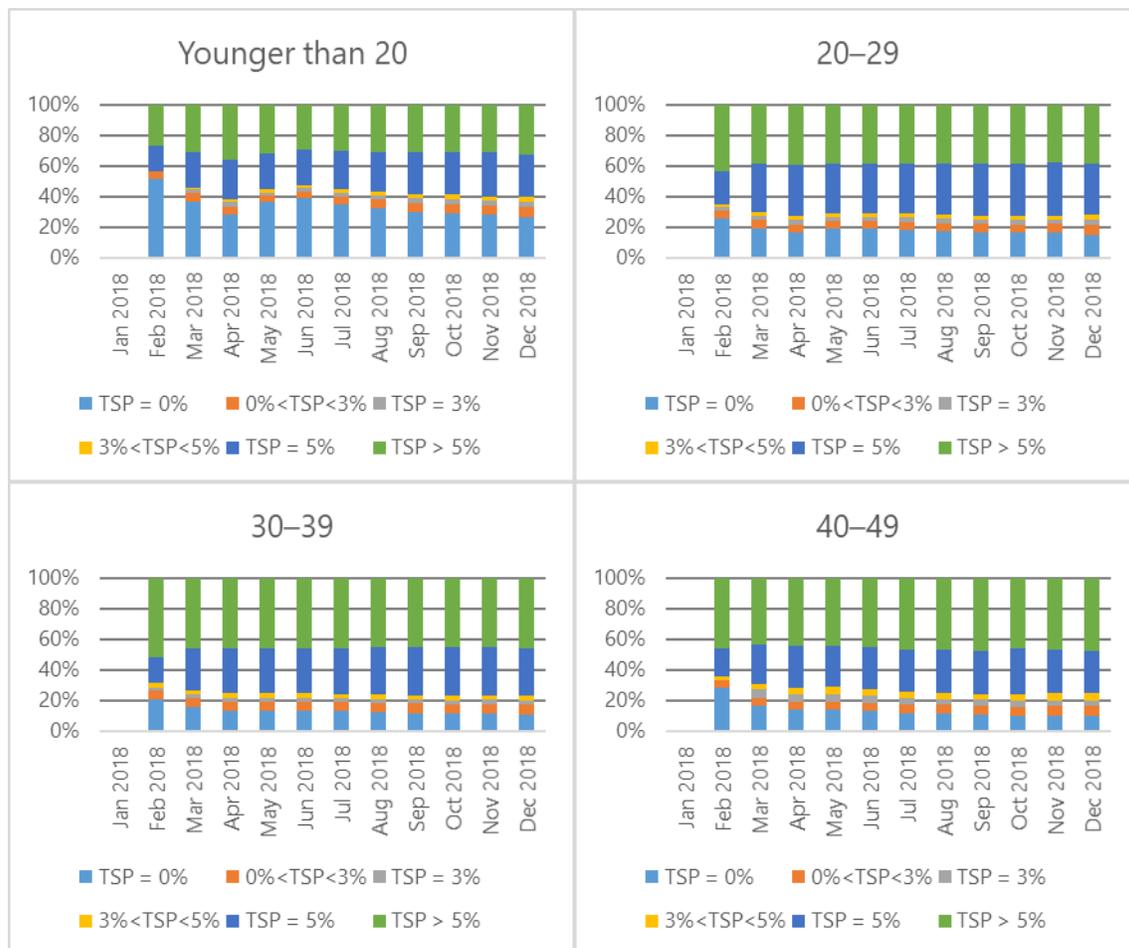
Notes: Sample sizes for Soldiers younger than 20 ranged from 37 (in February) to 1,799 (in December). Sample sizes for Soldiers aged 20–29 ranged from 1,337 (in February) to 40,028 (in December). Sample sizes for Soldiers aged 30–39 ranged from 564 (in February) to 12,236 (in December). Sample sizes for Soldiers aged 40–49 ranged from 39 (in February) to 1,012 (in December).
Source: TSP.

Figure 38. Navy TSP contribution rates by age, opt-ins, 2018
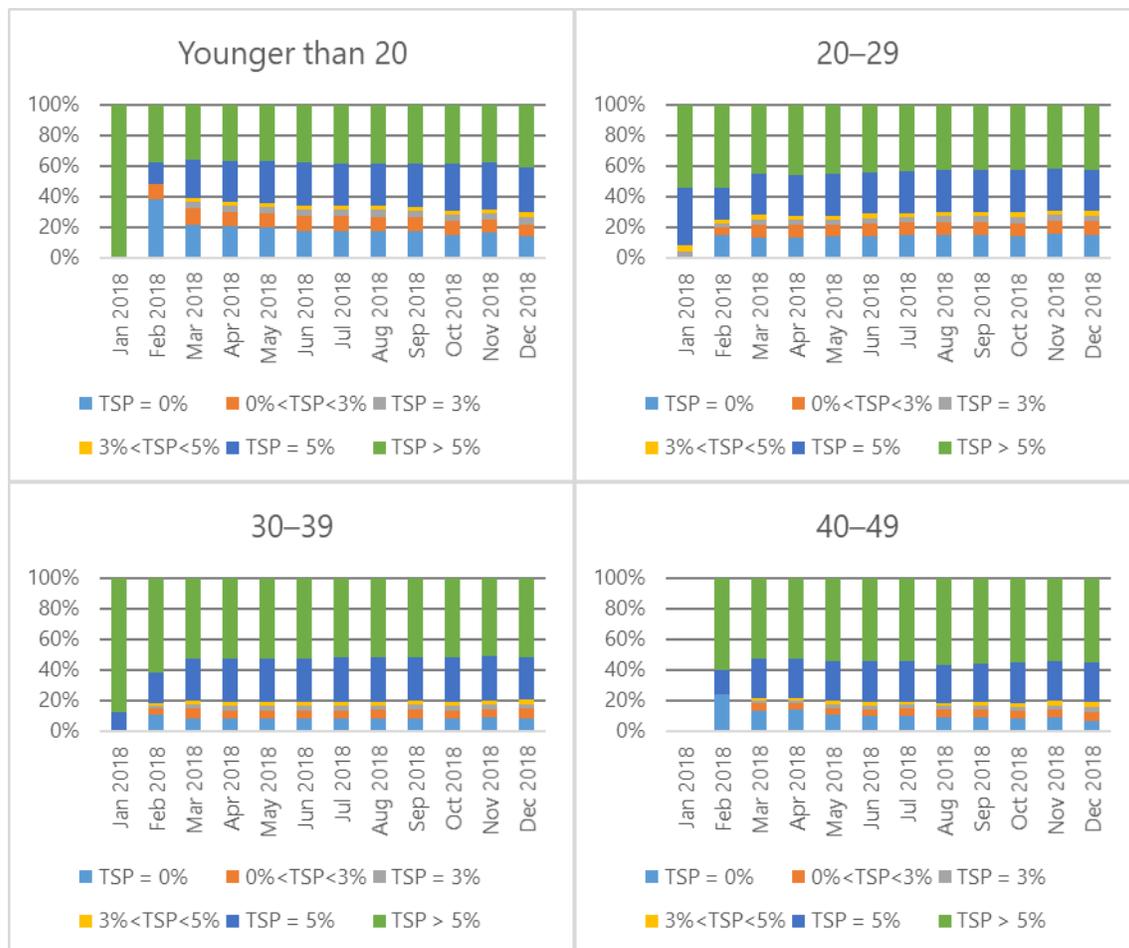
Notes: Sample sizes for Sailors younger than 20 ranged from 2 (in January) to 12,161 (in December). Sample sizes for Sailors aged 20–29 ranged from 24 (in January) to 97,341 (in December). Sample sizes for Sailors aged 30–39 ranged from 17 (in January) to 12,892 (in December). Sample sizes for Sailors aged 40–49 ranged from 25 (in February) to 565 (in December).
Source: TSP.

Figure 39. Air Force TSP contribution rates by age, opt-ins, 2018
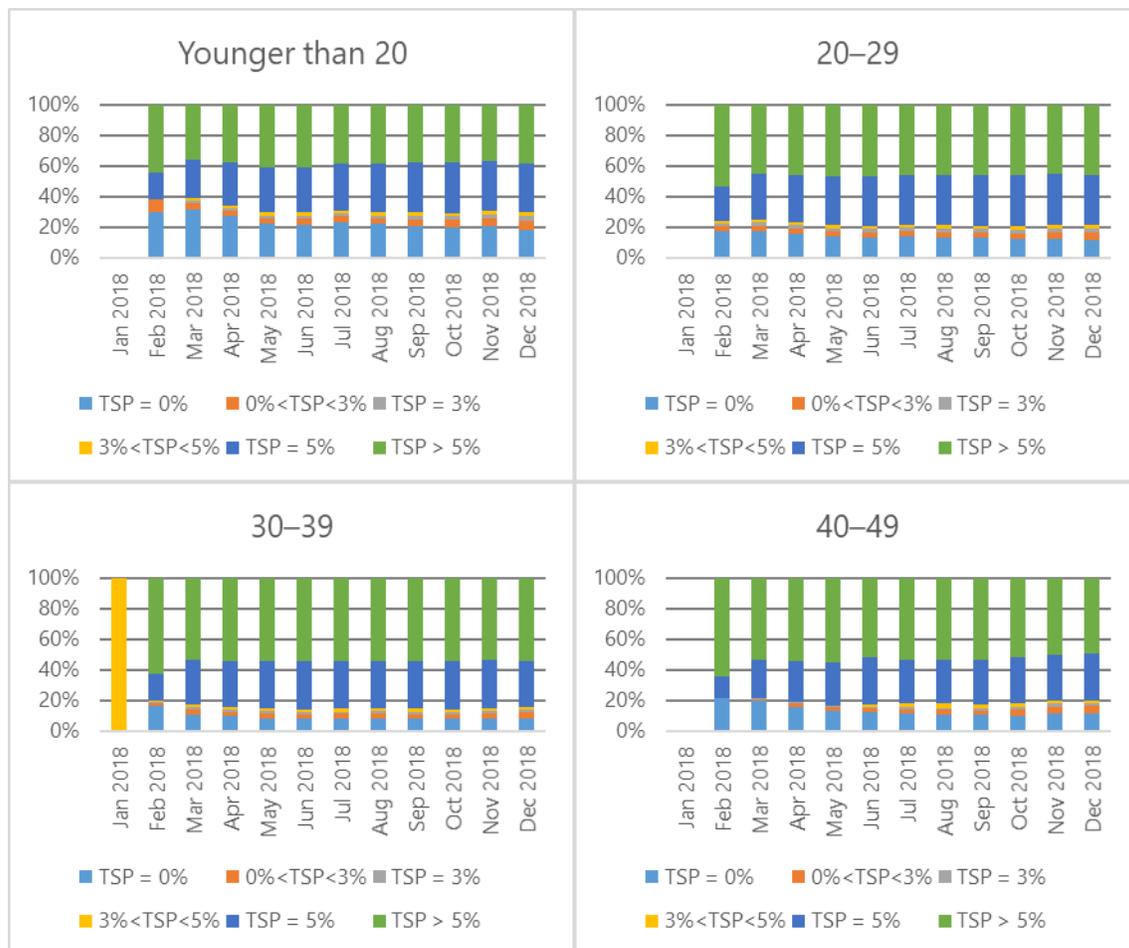
Notes: Sample sizes for Airmen younger than 20 ranged from 34 (in February) to 2,555 (in December). Sample sizes for Airmen aged 20–29 ranged from 1,017 (in February) to 40,740 (in December). Sample sizes for Airmen aged 30–39 ranged from 1 (in January) to 7,965 (in December). Sample sizes for Airmen aged 40–49 ranged from 14 (in February) to 289 (in December).
Source: TSP.

Army, Navy, and Air Force TSP contribution rates by basic pay level

Auto-enrollees

Figure 40, Figure 41, and Figure 42 show the respective contribution rates among auto-enrolled Soldiers, Sailors, and Airmen by pay range.[33] These figures should be interpreted with caution, and are placed here rather than in the body of the report, both because they do not contain BAH or BAS (which may affect contribution levels) and because sample sizes fluctuate substantially from month to month.[34] In particular, the number of Servicemembers earning $25,000–$49,999 drops noticeably in October 2018 for all three Services. Similarly, the number of Soldiers, Sailors, and Airmen earning less than $25,000 falls precipitously in December 2018, coincident with sharp increases in the numbers of Servicemembers in higher basic pay bands (though only those earning $25,000–$49,999 are shown here). It is possible that these fluctuations could reflect inconsistencies in how Servicemembers were paid in the beginning of the fiscal year; however, additional research and data would be necessary to determine whether this is in fact the case.

As with Marines, increases in income are correlated with increases in the probability of contributing 5 percent or more to the TSP across the other three Services. However, contribution levels among auto-enrollees earning $25,000–$49,999 fluctuate considerably across all three Services due to low sample sizes earlier in the year and the large variation in sample sizes between September and December. Across all three Services, there is a downward trend in the share contributing 3 percent (ignoring October and December due to sample size inconsistency), though this is most clearly visible in the Navy.

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[33] We omit graphs for Servicemembers earning $50,000 or more, since very few auto-enrollees in any Service earned this amount prior to December 2018.

[34] Additionally, they do not include BAH or BAS, which may affect contribution levels.

Figure 40. Army TSP contribution rates by annualized basic pay, auto-enrollees, 2018
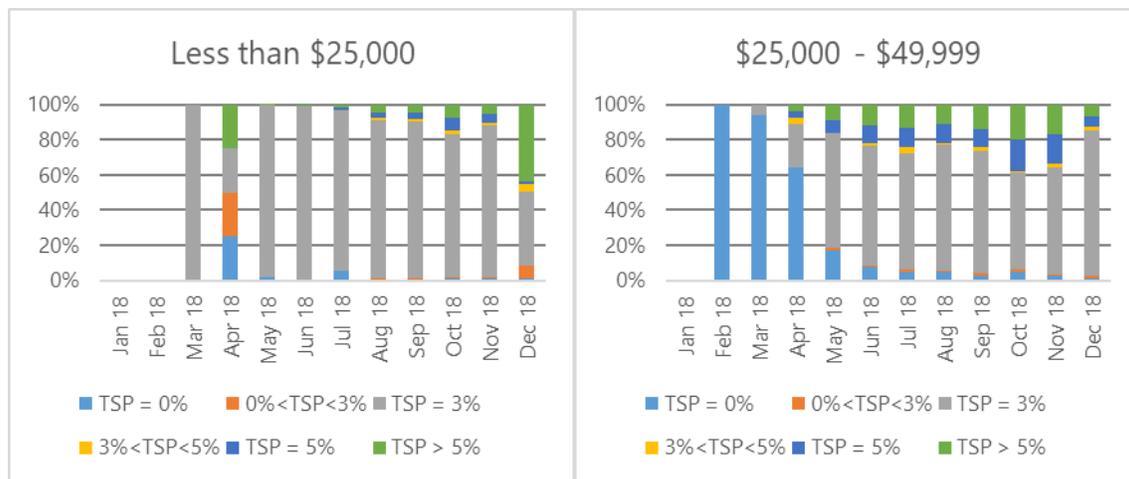
Notes: Sample sizes for Soldiers earning less than $25,000 ranged from 1 (in March) to 16,443 (in November). Sample sizes for Soldiers earning $25,000–$49,999 ranged from 3 (in February) to 22,275 (in December). Source: TSP.

Figure 41. Navy TSP contribution rates by annualized basic pay, auto-enrollees, 2018
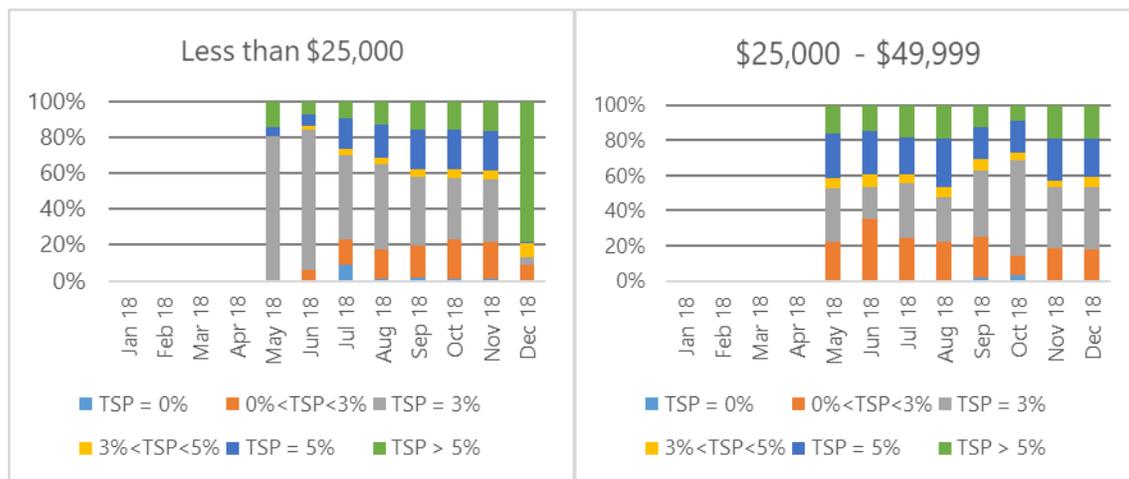
Notes: Sample sizes for Sailors earning less than $25,000 ranged from 31 (in May) to 11,081 (in October). Sample sizes for Sailors earning $25,000–$49,999 ranged from 122 (in May) to 14,612 (in December). Source: TSP.

Figure 42. Air Force TSP contribution rates by annualized basic pay, auto-enrollees, 2018
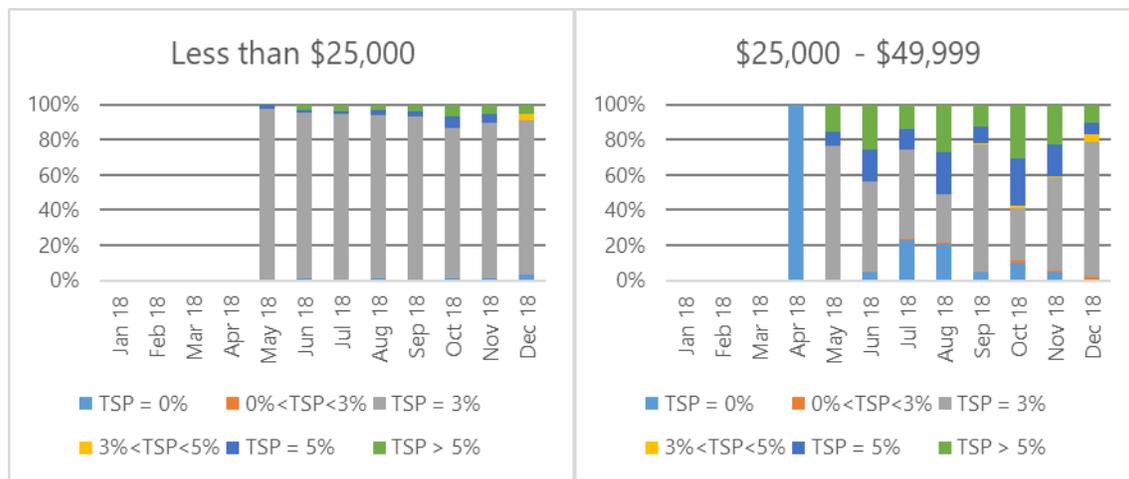
Notes: Sample sizes for Airmen earning less than $25,000 ranged from 48 (in May) to 5,512 (in November). Sample sizes for Airmen earning $25,000–$49,999 ranged from 1 (in April) to 7,257 (in December).
Source: TSP.

Opt-ins

Figure 43, Figure 44, and Figure 45 respectively show how Soldiers, Sailors, and Airmen who opted in to the BRS contributed to the TSP. As with auto-enrollees, these figures should be taken with caution. For example, many more Servicemembers had over $75,000 of annualized basic pay and many fewer had under $50,000 in annualized pay in March and in December than in any of the intervening months. Furthermore, as with auto-enrollees, there is a noticeable dip in the number of Servicemembers earning annualized basic pay over $100,000 in October relative to September or November. Any interpretation of patterns in the data should therefore focus primarily on April through September.

Opt-in Soldiers were less likely than Sailors or Airmen to make any contribution or to contribute over 5 percent to the TSP. Across all three Services, basic pay levels correlated with any contribution. Sailors were the most likely group across all income categories to contribute between 0 and 3 percent. These graphs do not show evidence of Servicemembers reaching the TSP contribution limit, which could reflect that many Soldiers, Sailors, and Airmen opted in over the course of the year, that contribution rates over 30 percent were flagged as potential errors, or other factors.

Figure 43. Army TSP contribution rates by annualized basic pay, opt-ins, 2018

Notes: Between 72 (February) and 6,181 (November) Soldiers earned less than $25,000. Between 321 (February) and 31,627 (November) Soldiers earned $25,000–$49,999. Between 722 (February) and 23,642 (December) Soldiers earned $50,000–$74,999. Between 293 (February) and 10,452 (December) Soldiers earned $75,000–$99,999. Between 7 (October) and 4,856 (December) Soldiers earned $100,000–$124,999. Between 4 (October) and 6,266 (December) earned $125,000-$150,000.
Source: TSP.

Figure 44. Navy TSP contribution rates by annualized basic pay, opt-ins, 2018

Notes: Between 42 (January) and 28,338 (November) Sailors earned less than $25,000. Between 1 (January) and 62,139 (November) Sailors earned $25,000–$49,999. Between 757 (February) and 57,487 (December) Sailors earned $50,000–$74,999. Between 334 (February) and 13,678 (December) Sailors earned $75,000–$99,999. Between 34 (October) and 5,334 (December) Sailors earned $100,000–$124,999. Between 26 (October) and 7,105 (December) Sailors earned $125,000–$149,999.
Source: TSP.

Figure 45. Air Force TSP contribution rates by annualized basic pay, opt-ins, 2018
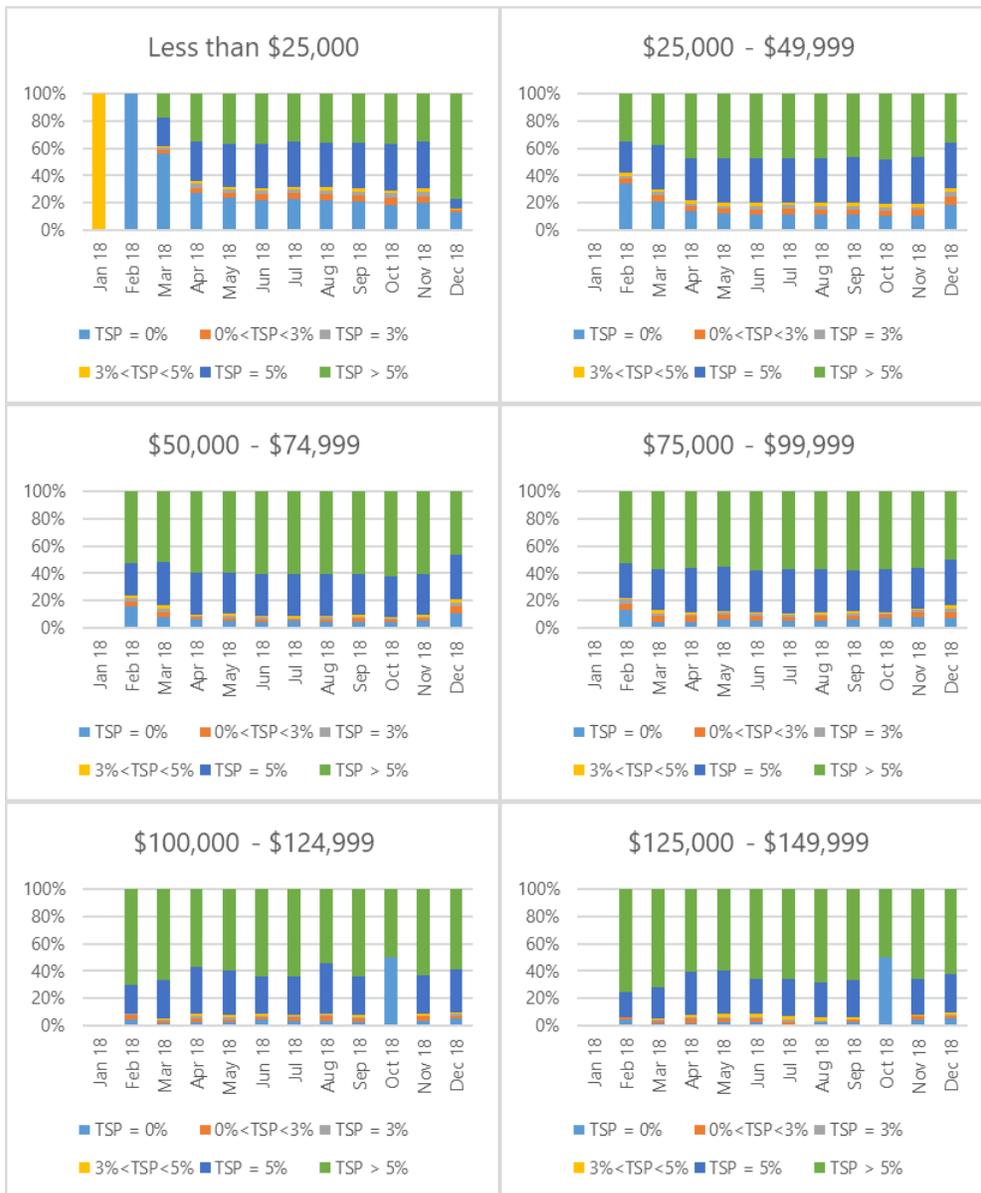
Notes: Between 1 (January) and 14,498 (November) Airmen earned less than $25,000. Between 252 (February) and 22,516 (November) Airmen earned $25,000–$49,999. Between 455 (February) and 19,788 (December) Airmen earned $50,000–$74,999. Between 164 (February) and 5,153 (December) Airmen earned $75,000–$99,999. Between 2 (October) and 2,924 (December) Airmen earned $100,000–$124,999. Between 2 (October) and 6,368 (December) Airmen earned $125,000–$149,999.
Source: TSP.

Figures

Abbreviations

AC	Active Component
AI/AN	American Indian/Alaska Native
BAH	Basic Allowance for Housing
BAS	Basic Allowance for Subsistence
BRS	Blended Retirement System
DFAS	Defense Finance and Accounting Services
DIEMS	Date of Initial Entry into Military Service
DIEUS	Date of Initial Entry to Uniformed Services
DMDC	Defense Manpower Data Center
DOD	Department of Defense
FMO	Force Management Objective
FRTIB	Federal Retirement Thrift Investment Board
LOS	Length of Service
MCRMC	Military Compensation and Retirement Modernization Commission
NDAA	National Defense Authorization Act
NH/PI	Native Hawai'ian/Pacific Islander
PDR	Personal Discount Rate
QRMC	Quadrennial Review of Military Compensation

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