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A framework for analyzing defined benefit pension insurance: The survivor benefit plan for veterans

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Abstract

Millions of defined benefit pensioners must select a pension insurance method. We present a framework for making this decision within the context of U.S. military veterans' Survivor Benefit Plan (SBP). Federal government subsidies generate a positive expected net payout for SBP. While insurance outcomes are typically skewed, the asymmetry of SBP outcomes is stark. In a common scenario, five percent of participants receive 60% of benefits. An alternative financial planning approach incorporates private insurance and investments and often bests the SBP. Actuarially correct life expectancy, moral hazard, taxes, and individual financial needs all play important roles in selecting a pension insurance program.

JEL classification: G23; H55; J38

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1. Introduction

Tens of millions of people in the United States with defined benefit (DB) pensions will face a key financial decision when they retire: whether and how to insure their DB pension for their spouse. These insured plans are common among state employees, certain federal

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employees, and, central to this analysis, military veterans. Richwine (2013) asserts that about 86% of local and state government employees have DB pensions. There are tens of millions of first responders and state employees as well as over 1.5 million military members who at retirement can opt for a life insurance product that pays beneficiaries a life annuity upon the insured's death. Additionally, although it covers private pensions, the Employee Retirement Income Security Act of 1974 (ERISA) requires DB plans to provide a survivor's benefit that gives pension payments over both the retiree's and spouse's lifetimes. These programs generally have "opt-out" features, meaning couples are defaulted into selecting joint benefits but can elect not to pay the costs for the prospective survivor benefits. Consequently, these couples and their advisors need a framework to analyze this key decision.[1] This article provides such a framework using the U.S. military's pension insurance program as a specific case. One can tailor the approach presented here to any of the tens of millions facing this decision.

For military service members the military pension insurance program is called the Survivor Benefit Plan (SBP). For years the conventional wisdom has been that military retirees should embrace the SBP. Among the reasons:

- It requires no medical exam,
- It is government-subsidized insurance (that implies it is more than actuarially fair),
- It takes care of a surviving spouse and/or children for their lifetime in real terms, and
- As Davis and Fraser (2012) summarize, it can provide substantial risk-free real returns.

While these points have merit, the analyses to date are admittedly incomplete. We expand earlier findings with this study and provide a more granular investigation of the SBP decision, particularly with respect to military retiree and spouse life expectancies, the skewness embedded in average returns, and market-based insurance and investment alternatives. We also approach this narrow decision from a holistic financial planning perspective and believe it is imperative that retirees deliberately and thoughtfully consider an SBP-like decision in light of their complete financial planning and life circumstances.

Based on our analysis, for a broad swath of the retiring military population, we reach the opposite conclusion of prior studies: that is, *we contend SBP is not an ideal approach to pension protection* or life insurance. More strongly, *our default position would be to recommend against SBP* unless an individual has a compelling reason or need to select it.[2] Because the SBP program is subsidized by the federal government, we posit that other DB pension recipients could reach the same conclusion when considering their pension insurance options. Finally, because this conclusion is not the default option during the busy time when one is transitioning to retirement, we advocate analyzing one's alternatives in advance of retirement by two to five years.

Before reaching these overarching conclusions, we map the distribution of potential outcomes SBP participants can expect to experience and summarize this comprehensive picture with three major findings:

1. The expected returns are more skewed than previously documented, with more than 60% of retirees in a common scenario expected to pay more into SBP than they receive, thus, losing wealth;

2. From a holistic financial planning perspective, SBP is largely irrelevant for the most-likely mortality scenarios; and
3. In circumstances where SBP is most valuable, there exist other life insurance mechanisms to provide similar, or even better, financial security.

Our article augments current tools available to federal employees making this critical financial decision. The Department of Defense Office of the Actuary maintains a SBP calculator on its website that quantifies the expected benefit based on user-customized inputs (http://actuary.defense.gov/, "Survivor Benefit Plan" tab). The general takeaway from this calculator is that SBP provides a financially valuable payout to those who subscribe. In contrast, this study provides more context for these calculations and for this important decision. We identify viable alternatives to the SBP and provide a novel calculator that allows individuals with unique circumstances to compare our proposed alternative and the SBP (this calculator is located at www.financialcheckpoints.com).

2. Background and literature review

As Poterba et al. (2007) show using a simulation methodology, public defined benefit pension plans are very generous. According to the analysis presented in Jennings and Reichenstein (2001), the present value equivalent of a retired military officer pension can readily exceed $1 million. Currently, military members receive a monthly pension amounting to 2.5% of their final 36 months' average pay (nominal) for every year of service.[3] For example, after 20 years of service at 2.5% per year, a retiree receives 50% times their high-36 month average pay, which is usually calculated from the retiree's last 36 months of pay. For the typical 20-year enlisted career this amounts to $2,100 per month in 2015; it is approximately $4,000 per month for a typical officer.

Given the longevity of the typical military retirement, these monthly cash flows are well worth protecting. The life cycle hypothesis holds that households seek stability in consumption and, thus, tend to save during their labor income years and dissave in retirement (Ando and Modigliani, 1963). With the diminishing marginal utility of wealth, losses are disproportionately harmful. In the event the military retiree dies without SBP protections, the spouse is not entitled to the retiree's retirement income. Annuitization stops as does the associated welfare gains found with annuities in standard life cycle models. This loss potential is problematic; people who are forward-looking, utility-maximizing, and understand longevity risk should, therefore, choose to protect this income stream to smooth consumption through time.

To this end, the military's SBP helps; it protects a portion of the DB pension cash flows that military members receive after 20+ years of service. To protect this pension for the military member's family, the SBP permits military retirees to pay up to 6.5% of their monthly pension pretax to guarantee their beneficiary up to 55% of the monthly retirement benefit should the military retiree die.[4] While the historical opt-in rates for SBP are not available to the authors, the Department of Defense (DoD) Actuary plans for a majority of retirees to enroll going forward, using a 50–60% election rate. Of these individuals, most

retirees (80%) who elect coverage choose the maximum amount ("Report of the Military Compensation and Retirement Modernization Commission," Final Report, January 2015; Military Compensation and Retirement Modernization Commission 2015). Under the typical enlisted retiree scenario, the retiree pays $137 pretax monthly for their surviving spouse to receive a taxable benefit of $1,155 per month. The typical officer's figures are $260 and $2,100, respectively.

Unlike the scenario in Lachance et al. (2003), which evaluates pensioners' option to buy back into a DB plan from a defined contribution plan, SBP provides very limited optionality. Similar to many pension insurance programs, the SBP is an opt-out program where the member and spouse must affirmatively elect to not pay for these benefits. New retirees and their spouses can opt out immediately or between the second and third year of retirement. Opt-out decisions are irrevocable, unless the retiree subsequently remarries or adopts a child. SBP spousal beneficiary payments continue for the remainder of the surviving spouse's life, or until the spouse remarries if he or she remarries before age 55. Premiums and payouts are adjusted with inflation annually. Premium payments cease after 30 years; however, the coverage continues for the duration of the member's life. If the spouse predeceases the member, both premiums and spousal coverage cease immediately. There are no refunds of premiums paid. For more extensive details on the SBP program, see Higdon (2009).

The SBP pension protection program is essentially an inflation-adjusted annuitized life insurance product. As such, the analysis here is relevant to many annuity options presented to public employees. To be clear, the SBP is not an investment, which makes comparing its return to investments inappropriate. Unlike Comprix and Muller (2011), for example, who find evidence private firms adjust their DB pension discount rate to suit their purposes, we are not concerned with a discount rate (i.e., expected investment returns beyond a risk-free rate) for U.S. government pension assets. Instead, insurance such as SBP operates under the principle of indemnity. Its intent is to make the insured whole after experiencing a loss. As with most insurance products, consumers should expect—and in most cases hope—that they will not have to realize any benefit from paying insurance premiums. Insurance products exist to prevent harmful large losses. As one author states, "it makes sense to buy insurance where the premiums will result in a known small loss" (Kitces, 2014). The question this study examines is whether SBP provides the best "known small loss" option for military retirees.

While recent work on pension insurance programs is limited (e.g., Bell and Graham, 1984, analyze 900 private pension plans' characteristics more than three decades ago), some analysis of the SBP program has been conducted. Jennings and Reichenstein (2001) demonstrate SBP is actuarially fair under the then-current rules. Using cost-benefit analysis, Beatty and Kang (2007) question the SBPs value in limited illustrative scenarios. SBP has been enhanced since these analyses, making it likely that SBP is advantageous for the typical participant. Davis and Fraser (2012) investigate two changes to SBP that took effect in 2008. First, a 30-year maximum payment timeframe was then implemented. Second, an offset feature that reduced SBP benefits for Social Security income was eliminated. The authors find that with these changes the average implied rate of return to SBP is a riskless 6.8% for a 45-year-old couple, suggesting the program returns make it quite appealing. Implied returns are especially generous for male retirees who have younger female spouses.

This study extends the SBP analysis of Davis and Fraser (2012) in ways they recommend and reaches more muted conclusions. First, we utilize life expectancy tables for military members rather than using those for the general population. The difference is nontrivial. Service members are subject to extensive initial health screenings and then mandatory annual physical fitness tests required to remain in the service. Military members also undergo routine preventive health exams that sometimes lead to preretirement medically-based diagnoses that can lead to separation from service. Accounting for these factors leads to a life expectancy for military retirees (i.e., those who serve 20-plus years) that is significantly higher than for the general population. The SBP experiences a smaller adverse selection problem than other insurance programs. Further, given that most military members are not married to other military members, the typical retiree spouse has a life expectancy more closely approximated by the general population. As a result, the probability of a spouse collecting SBP diminishes substantially. In contrast to prior analyses, using military-relevant life expectancy tables reduces the financial appeal of SBP.

Other contributions of this study address recommendations proposed in Beatty and Kang (2007). That is, we provide a rich set of life expectancy distribution data, absolute payoff data, and expected payoff distribution data for a variety of member-spouse mortality combinations, to include child-only SBP coverage (the online calculator allows myriad age and status combinations; however, this article depicts the most statistically common scenario for illustration purposes). We provide this analysis for both the SBP option as well as a viable cost-neutral alternative, which includes purchasing privately-issued level-term life insurance coupled with investing the difference between these private premiums and the SBP premiums. Instead of simulating possible member-spouse mortality scenarios, we provide the joint life expectancy distribution for individual couples. This allows military members to identify the tradeoffs associated with SBP decision by forecasting a very wide spectrum of possible outcomes based on their unique circumstances. Furthermore, we present the entire outcome space, which accurately depicts the proportion of probable SBP "winners" and "losers" for the first time. This approach enables one to better view the mortality landscape and the associated skewness in the payoff distribution.

3. Data and methodology

It is important to recognize that on average SBP-insured military officers live longer lives. Just as the Social Security Administration (SSA) calculates life expectancy tables for the general U.S. population, the DoD Actuary generates tables for military retirees.[5] Fig. 1 shows that military officer retirees have markedly higher survival rates at every age relative to general population men and women. While data for first responders are not available to us, we posit that their life expectancies approximate those of military members more closely than those of the general population given similarities in health screening, physical training, job-related physical requirements, and job-related risk.

On the beneficiary side of the equation, it is important to recognize that according to the DoD Actuary, military spouses unfortunately do not experience the same expected longevity as the retired military members. Currently, most military retirees are males (90%+),[6] and

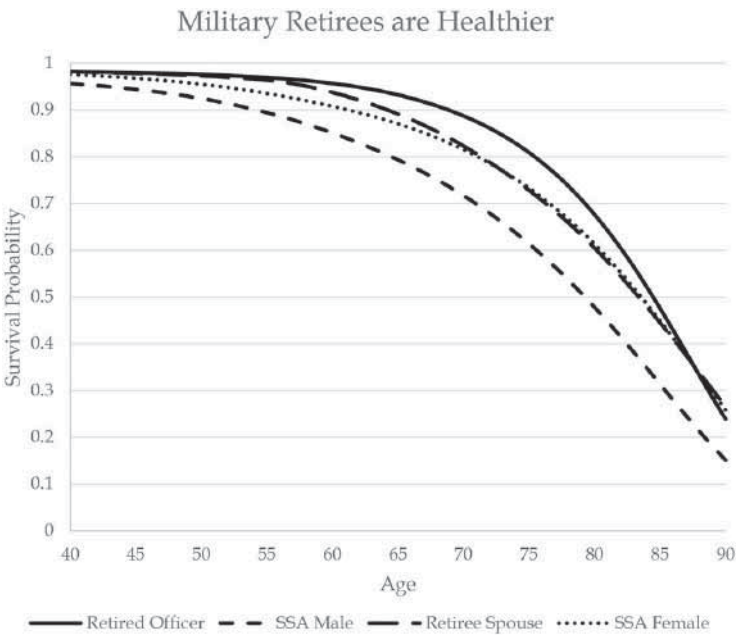

Fig. 1. Survival probability of U.S. citizens, U.S. military retirees, and retirees' spouses. This plot shows the probability of survival by age for an average U.S. male and female according to the Social Security Administration. It also shows the probability of survival for U.S. military officer servicemembers who retire and their spouses, according to the Department of Defense Actuary Office.

married military members tend to wed non-military spouses (90%+).[7] These unbalanced figures aid our analysis, because the DoD Actuary does not report retiree and spouse tables by gender. Because the vast majority of spouses are female, we can compare SSA female probabilities to military retiree spouses. Fig. 1 shows the probability of survival for military retiree spouses relative to the general population females. Retiree spouses have slightly higher survival probabilities than SSA females before age 70, but after age 70 they are comparable. Because military retirees and their spouses differ from the general population, this warrants an analysis that focuses on their unique life expectancies. Because prior studies use SSA life expectancy for both military retirees and spouses, they potentially overstate the SBP value.

To illustrate our method and showcase our results we use a currently common officer retirement scenario. Our baseline scenario involves a military male retiree age 44 married to a non-military female who is also 44 years old. At this point a typical officer would have a 20–22 year career, while the typical enlisted member would have a 22–26 year career. The officer retiree's insured amount is $55,000. We further assume the spouse does not remarry once the service member dies. In fact, if a beneficiary spouse remarries before age 55, then SBP payouts cease unless the remarriage ends in divorce or the new spouse dies. We do not incorporate this remarriage probability. The value of SBP would decrease relative to the baseline scenario shown here if remarriage were considered. As for our dollar value calculations, because future SBP premiums and payouts adjust with inflation, we do not use a discount factor to adjust them.[8] Finally, given our personal biases, we demonstrate the typical officer retiree calculations, summarize some others, and allow the reader to explore

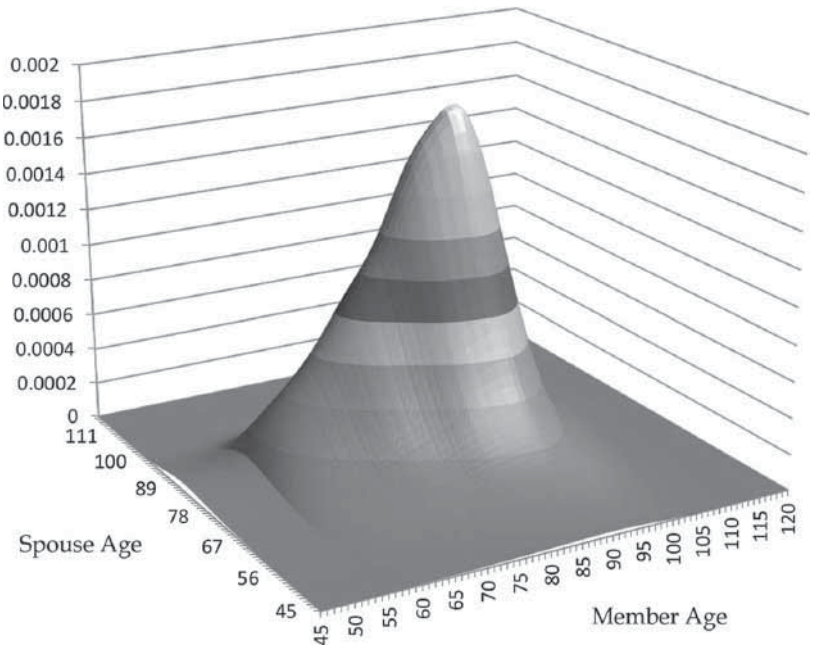

Fig. 2. Joint probability of mortality for U.S. military retirees and spouses. This plot shows the joint probability density function for mortality age of U.S. military retirees and their spouses when both are currently age 44, according to the according to the Department of Defense Actuary Office. The military member is male; the spouse is female in this illustration. The highest expected joint probability occurs when the member is age 88 and the spouse is age 89.

alternative scenarios using an online calculator. Obviously, there are many permutations to this scenario; we summarize a few at the end of this study.

Coupling these assumptions with the SSA and DoD life expectancy tables allows us to generate a joint probability density function for expected mortality at any age combination the military retiree and spouse might experience. Fig. 2 depicts this joint distribution for our age 44 officer retiree scenario, with the highest (or most likely) mortality combination occurring when the retiree is 88 and the surviving spouse is 89. As expected, the joint distribution is left-skewed toward lower ages given the rather abrupt upper-bound on mortality (i.e., the virtual impossibility of living much beyond 110). For ease of interpretation, most of the subsequent figures incorporate the same basic format and perspective as Fig. 2.

4. Results

While the joint life expectancy information is necessary, the payouts associated with these life expectancy combinations is equally important. We calculate these net SBP payouts in Fig. 3. While we calculate payouts based on $55,000 of retired officer pay, payout calculations are the same on a percentage basis for any retiree because of the percentage-based calculations of SBP premiums and payouts. Fig. 3 shows absolute amounts for the typical officer retiree. It implements the same x- and y-axes as Fig. 2; however, it quantifies spouse's

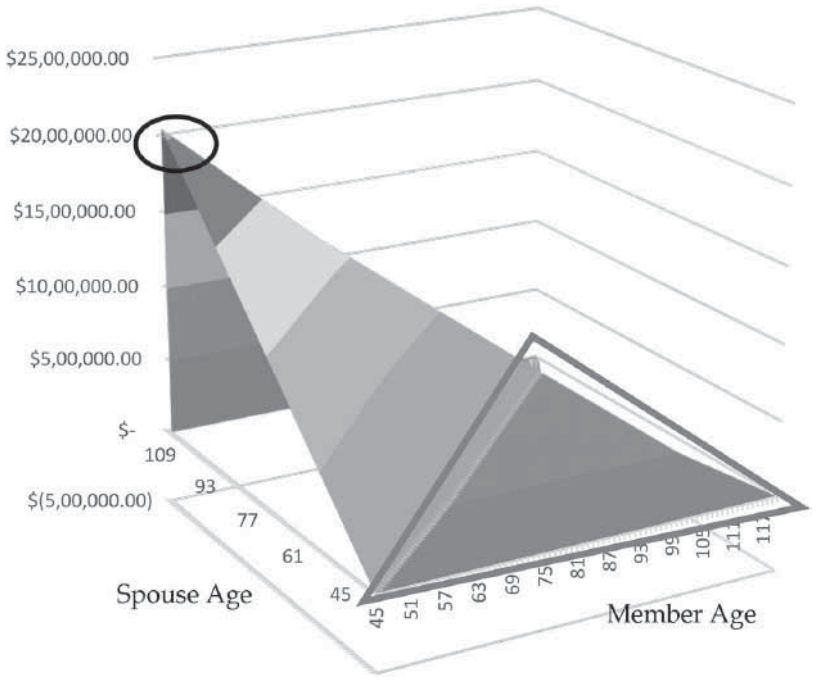

Fig. 3. Survivor Benefit Plan (SBP) net payout (benefits – costs) for U.S. military retirees and spouses. This plot shows the SBP net payouts, equal to the insurance payout minus premium costs, for various mortality combinations of a military member and nonmilitary spouse who elect to purchase SBP pension protection.

payout minus the member's premiums for each retiree-spouse mortality combination. For instance, if our 44-year-old military retiree lives to age 50, then he has paid six years' worth of SBP premiums, or $21,450. If the officer's equivalent-aged spouse then lives to age 70, she collects 20 years' worth of SBP payouts, or a total of $605,000.[9] Taking the difference between these payouts and premiums yields a net real payout of approximately $583,550 for the officer who opts for SBP pension protection in this scenario.

Fig. 3 shows who can expect to win and to lose—in strictly financial terms—from the SBP program. The extreme SBP "winners" are, sadly, the spouses of SBP-covered military members who die immediately after retiring (as we discuss later, this analysis does not account for the fact that retirees carry their active duty SGLI [life insurance] coverage for 120 days into retirement at no cost). We hope that the reader understands we put the word winners in quotations for obvious reasons, as we would rather nobody experiences this situation! Clearly, the untimely death of a spouse is a personal and financial catastrophe we wish everyone could avoid. The extreme winning combinations are those in the circled area of Fig. 3. The net payout value for officer retirees' spouses in this plot approaches $2 million in the extreme case where a retiree dies immediately, the surviving widow stays single or remarries after 55, and then she lives to well over 100.

The net payoff function for the SBP "losers" has a lower bound at 30 years' worth of premiums, or $107,250 in our baseline scenario. The maximum negative net payouts—that represent the worst "losing" situations—occur when the military member pays 30 years' worth of SBP premiums and the military retiree's spouse does not survive the retiree. Using DoD mortality assumptions, this occurs more often than not. In this scenario where the retiree and spouse are the same age, the probability that the spouse outlives the military

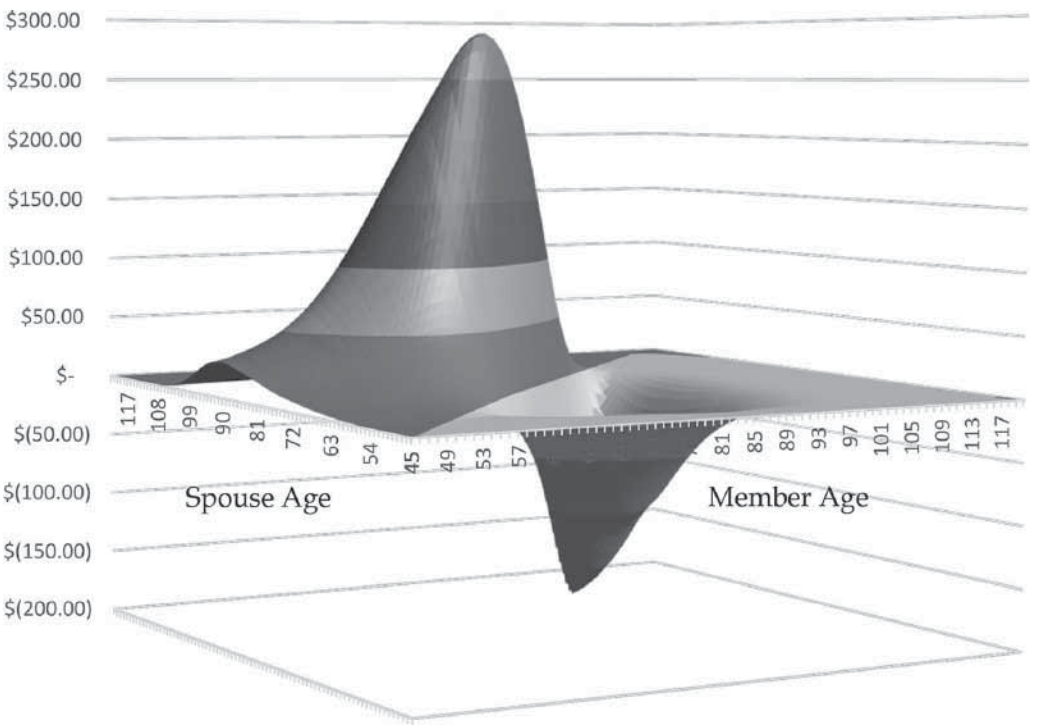

Fig. 4. Expected Survivor Benefit Plan (SBP) net payout for U.S. military retirees and spouses. This plot shows the probability-weighted SBP net payouts for various mortality combinations of a military member and nonmilitary spouse who elect to purchase SBP pension protection.

retiree is around 42%, markedly lower than the almost 60% calculated using SSA mortality tables (Davis and Fraser, 2012). Yet, this result is not surprising given the survival probability differences shown in Fig. 1. The triangle over the trough in Fig. 3 highlights the negative payout scenarios. The cost-benefit breakeven point for a spouse to recoup all 30 years' of premiums is 3.55 years ($107,250 worth of 30-year premiums divided by $30,250 annual payout for officers), meaning a spouse must outlive the retiree by approximately three and one-half years to recoup all SBP premiums. More generally, for SBP payouts to offset premiums paid (i.e., breakeven) at any point in time, the spouse beneficiary must outlive the insured member by 12% of the total duration that the couple has paid SBP premiums.[10] The upward sloping payout on the right side of the triangle represents the mortality combinations where the spouse predeceases the retiree. In these situations, the retiree has paid some premiums—but not the full 30 years' worth—and ceases paying upon the death of his spouse.

Having laid the groundwork for understanding joint life expectancy and absolute payoffs, we can now quantify the expected costs versus benefits of the SBP program for an officer retiree. This is done by simply multiplying the values in Figs. 2 and 3. Doing so yields Fig. 4, which plots the expected net payout contour for the couple in our scenario. Visually, the joint life expectancy probabilities dominate the surface relative to the payouts. Because there is a high probability of both a military retiree and his spouse living around 80 years, these probabilities tend to dominate the net gains and losses shown in Fig. 3. The likelihood of "winning" in the SBP—again, the member dying

tragically young and spouse living for a long time—is so low that the multimillion-dollar payout scenario scarcely registers.

Recognizing that the volume under the curve in Fig. 4 represents the aggregate expected value of SBP (i.e., Probability × Net payout, where sum of probabilities equals one), some noteworthy observations result. For instance, as the SBP program and prior authors have noted, the program is not actuarially-neutral. In fact, its expected net payout (i.e., benefits minus premiums) for this scenario is over $61,000. Thus, as many claim, SBP is a subsidized program for the benefit of military retirees. Also, the knife-edge between winning and losing in the center of the plot stands out. Probabilistically, it is almost a toss-up between whether (1) the retiree dies early enough for his spouse to collect enough SBP for a positive net payout (represented by the peak) and (2) the retiree either lives too long for his spouse to collect enough SBP or that she predeceases him, represented by the deep depression.

We now ask where the SBP value comes from and whether that value most effectively addresses the retiree's needs. It turns out that almost 60% of the SBP value comes in an expanded definition of who are the SBP winners. Specifically, let us expand the definition of winners to include those scenarios where the military retiree dies before age 66, and his spouse lives at least 10 years more. In other words, the retiree dies relatively young, and the spouse then survives for at least another decade. While this particular scenario occurs less than five percent of the time, it represents almost 60% of the SBP total expected value. Stated differently, for a common retiree-spouse scenario, non-winners represent over 95% of the scenarios but only collect 40% of the expected SBP benefit.

The returns to SBP are exceedingly skewed toward those who die relatively young and have long-lived surviving spouses who do not remarry. A minority of people get more back than they spend, and a *very* select few get exceedingly high returns. There is over a 60% probability that SBP participants will pay more into the SBP program than they ever receive, despite its federally-subsidized status. This finding surprises us, given that when asked, "Is SBP a Good Buy?", the Military Pay and Benefits website sponsored by the Office of the Under Secretary of Defense for Personnel and Readiness responds, ". . . the answer for most retirees is yes!"[11]

Having defined the winner as a low-odds 1-in-20 scenario, we now expand the definition and determine who are the "usual winners" of SBP. These are couples in which the military retiree dies after age 66 (i.e., dies later) and the spouse then lives at least 12% longer than the retiree has been retired (i.e., to get past the breakeven point discussed earlier). Because these are more likely outcomes, it is critical to consider these cases. By age 67, a beneficiary spouse will have Social Security options and often other savings (retirement and other), and perhaps a pension from the spouse's own job. As a result, the SBP decision becomes one of marginal wealth. That is, given the couple's other endowments (savings) and income (Social Security and pension), will the marginal SBP protection be necessary in the most probable situations? We contend the answer to this question is: probably not. Thus, our results directly counter the argument that one should buy SBP because the expected return to SBP is positive. Note that we do not contend pension insurance is universally a bad idea. Rather, in contrast to prior findings, we argue that the default position should be against SBP based strictly on the financial calculations so long as other alternatives exist. We detail some of these alternatives next.

5. Alternatives to the SBP

If not SBP or any analogous pension insurance, then what? Given the statistical unlikelihood of winning the SBP or even experiencing the previously-advertised positive expected return, what is a (military) retiree to do to protect his or her family? After all, it would be imprudent to forego pension protection in the early retirement years, which programs like SBP provide. And the typical military member remains poised and inevitably wants to *act* on the information provided here. Fortunately, there are some alternatives to consider.

5.1. Invest for the long term

The first—and most basic—alternative is simply to invest the SBP premiums for long-term growth rather than using it for this insurance that will most likely never pay out. According to Davis and Fraser's (2012) analysis, if a retiree were to earn a real investment return of 6.8%, he or she would be equally well-off relative to participating in SBP. However, considering the level of risk required to earn 6.8% real returns on investments compared with earning these returns in an essentially riskless government benefit (i.e., SBP), a fiduciary would be hard-pressed to recommend a pure investment strategy over a virtually riskless SBP strategy.

Relying on uncertain investment returns to pay off sufficiently when needed presents a risky strategy. Additionally, it simply ignores the nonfinancial utility enhancement life insurance can provide. We do not recommend this approach because it does not protect the surviving spouse in the rare but catastrophic situation where the retiree pensioner dies prematurely. Even if one assumes investment returns that are exceedingly high by historical standards, portfolio values would likely be insufficient given the short investment horizon. Indeed, a pure investment strategy would only be able to provide SBP equivalent protection for a retiree who dies much later in life.

Truthfully, this option represents a so-called straw man. From a holistic financial planning perspective, it would be imprudent to not protect one's DB pension in the event of an untimely death, especially if one's dependents rely on the pension for nondiscretionary living expenses. A risky investments strategy is exactly that—risky.

5.2. Buy term and invest the difference

The more responsible option, therefore, becomes the old financial planning adage: "buy term and invest the difference," which we call the term-and-invest strategy. One typically sees this phrase when comparing the purchase of whole life, or cash value, insurance to the option of buying level-term life insurance. Notably, we do not model a whole life policy option in this analysis. The reasons for doing so are two-fold. First, in our military retiree example, these individuals are already conditioned to paying for a term life insurance policy called Servicemembers' Group Life Insurance (SGLI) during their time in service. Transitioning to another term policy is a familiar construct. Secondly, and more importantly, we are considering an illustrative option that is cost-neutral for the military retiree couple when compared with SBP. Whereas cash value insurance guarantees coverage for life, doing so

involves much higher premiums—on the order of 10 times the cost of term life insurance for the same face value (we depict these premiums in Fig. 6). The typical level-term insurance we model has a fixed premium for a fixed amount of insurance benefit for a finite period of time. Term premiums and the insurance coverage amounts are nominally fixed but decrease over time in real terms. Once the level-term contract expires, if the individual is insurable, the insured can typically renew a policy for higher premiums, lower death benefit, or a combination of the two.[12]

Because both SBP and a term-and-invest strategy provide the utility of having life insurance, it is not necessary to quantify this value explicitly. Instead, for this analysis, the relevant considerations are (1) the cost of the SBP coverage, (2) the insurance needs of the retiring military member, and (3) the cost of these needs from a private insurance provider. We once again consider the case of our typical officer, a Lieutenant Colonel (O-5) retiring after 20 years of service at age 44, who has a 44-year-old spouse. Making some reasonable assumptions for these considerations allows us to quantify this term-and-invest alternative.

Using an income replacement strategy, foregoing SBP and using private life insurance means our male officer retiree would need to replace $30,250 in annual SBP income for his nonmilitary spouse. If we use the well-documented Bengen (1994) four percent payout rule, the amount of insurance coverage required to provide a real lifetime annuity of $30,250 is approximately $756,000. Given recent skepticism of the four percent rule as too aggressive, one might plausibly decrease it to 3.5% or lower. If we use 3.5%, the insurance value increases to $864,000. For this analysis we use $800,000 in coverage as a happy medium, which is conveniently the maximum insurance policy our insurance quote source will write for many active duty officers. We recognize this payout rule is a hotly debated heuristic and do not intend to provide a recommendation here. Instead, we leave it to an advisor or planner to conduct sensitivity analyses based on their own philosophies and/or their clients' situations. Note that the four percent payout rule and its kin assume inflation adjustments, just as the SBP does.[13]

Well-known private companies servicing military members provide level-term life insurance quotes via their Websites.[14] A 44-year-old male nontobacco user in good health can purchase an $800,000, 30-year level-term policy for approximately $125 per month. Assuming the insurer has sufficient financial strength, this insurance policy can serve the same need as the revenue stream provided by SBP at less than half the cost of SBP (i.e., $125/month vs. $297/month). It is important to acknowledge that insurance payouts are generally reliable but have more risk than SBP payouts that the federal government backs. Therefore, we consider two companies' products. One company has either the highest or second-highest of 16 or 21 possible ratings from A.M. Best, Moody's, and S&P; the other has been in business for over 100 years but does not purchase ratings.

In the long-term, a key part of this buy term and invest the difference option is to invest the savings. Rather than consuming the $172 monthly savings if purchasing life insurance instead of SBP, one can save and invest these funds to offset the loss of insurance in 30 years when the term life contract expires. We cannot overemphasize the fact that maintaining budget and investment discipline is required for this option to succeed. While it would be appealing to use an expected market return on an investment portfolio, doing so is not

consistent with finance theory. Although they analyze the pension problem from the payer side (vs. our focus on the recipient), Brown and Wilcox (2009) cogently argue for using returns that are risk-equivalent when analyzing investment performance. To ensure we are comparing risk-equivalent alternatives, we compound the savings component at three percent annually and use a 2.5% inflation rate to obtain real dollar values from the buy-term-and-invest strategy.[15]

Fig. 5, Panel A, shows the present value to the surviving spouse of this term-and-invest strategy under the aforementioned assumptions for all previously considered mortality scenarios. In the early years the value of this strategy comes from the level-term policy. However, because of its nominal $800,000 value, it decreases in real terms until it expires at 30 years. Correspondingly, the nominal premium also decreases in real terms over time. The sharp drop off in benefits occurs at the 30-year point when the policy expires. At this point we see the value of the investments increasing in an exponential manner. To be clear, we assume all investment contributions cease upon the retiree's death. However, in the case of a spouse's death we assume the retiree continues saving and paying the life insurance premium since he still receives a pension and might have other desired beneficiaries, such as children or charities. Also, we see no difference between the winner scenario (i.e., retiree dies young; spouse lives for decades) and the scenario where both partners die young. This present value equivalent payout is independent of the surviving spouse's life span; it hinges only on when the retiree dies. As we see, dying immediately after the term policy expires (age 74+) presents the worst situation. At this point the investment amount is modest, and the level-term coverage is gone. To the extent one can extend the level-term policy at a reasonable rate or buy a level-term policy that extends beyond 30 years, these might represent even more appealing options.

The overall expected net payoff for the term-and-invest strategy is $162,214 in our baseline scenario, $100,946 greater than the expected net payoff ($61,268) of the SBP option. A subsequent figure summarizes these expected net payoffs for many retiree-spouse age combinations.

The next figure depicts the horse race, directly comparing payouts to the SBP and the term-and-invest strategy. Fig. 5, Panel B, expands the earlier figures by differencing Fig. 5, Panel A, and Fig. 3. That is, it shows the *net payout of term-and-invest* minus *SBP* for various mortality combinations. Anywhere the plot is positive, the term-and-invest strategy bests the SBP strategy, and vice versa. Fig. 5, Panel C shows the mortality probability weighted version of the Panel B.

Some valuable observations emerge from these figures. First, when SBP really matters—that is, if a retiree dies early and the beneficiaries need immediate funds to pay off a mortgage, and so forth, then the term-and-invest option has a higher present value than SBP (see circle in Panel B). Second, there is once again a large payout reduction in the term-and-invest option when the level-term policy expires. This result induces us to recommend that a prospective retiree consider stretching the term policy as far as possible within reason. Next, there clearly remain mortality combinations where the individual is "less-covered" by insurance than by SBP, shown in Panel C by the negative expected payout areas of the contour. However, these points occur later in life, at around age 75, when one would expect other income streams—like retirement accounts, pensions, or Social Security—to

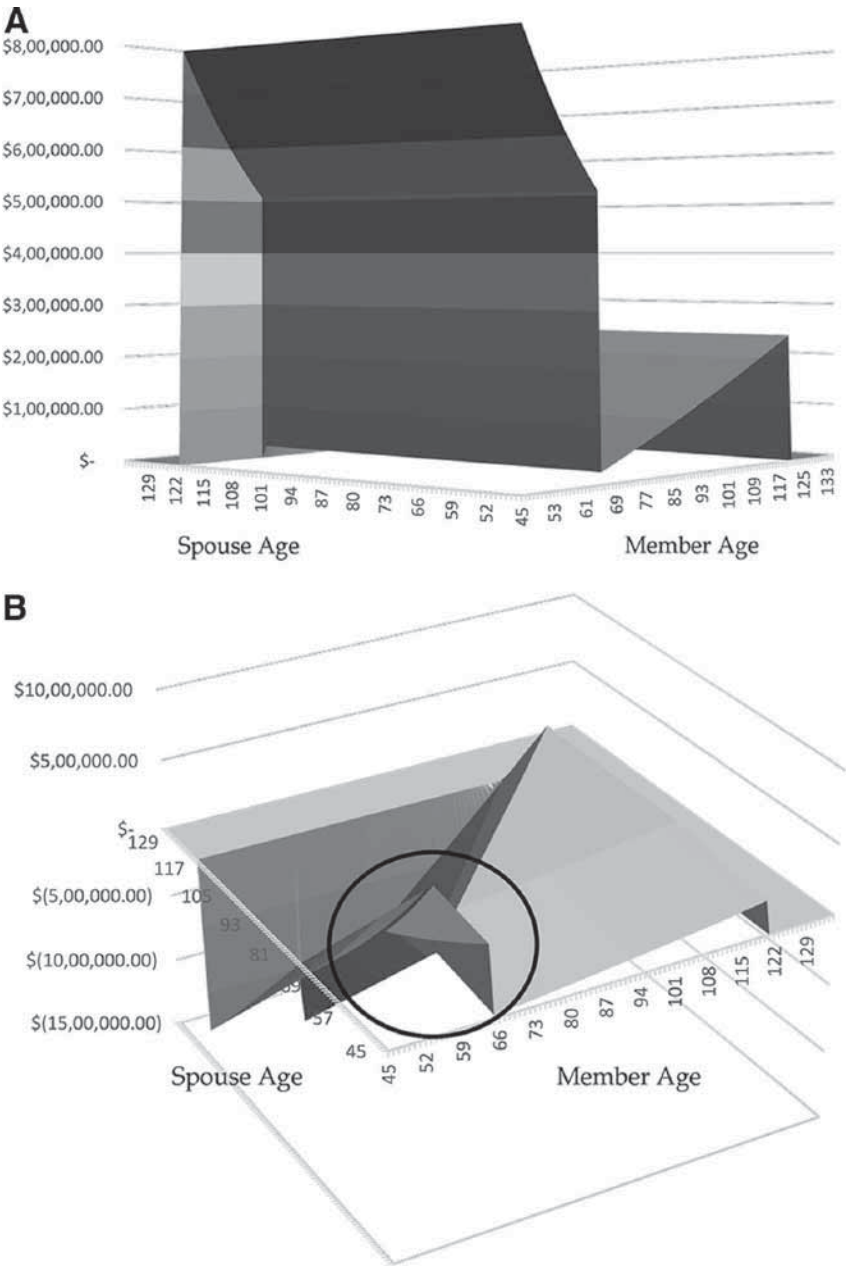

Fig. 5. Panel A: Payout for the buy-term-and-invest strategy. This plot shows, for a variety of mortality combinations, the present value of payouts for a strategy of buying a term insurance policy and investing the difference between the cost of the term insurance policy and SBP. The term and invest strategy assumes an $800,000 30-year policy costing $125/month, 3% return on investments, and 2.5% inflation. Panel B: Payout difference between the term-and-invest strategy and Survivor Benefit Plan (SBP). This plot shows, for a variety of mortality combinations, the difference in payouts between SBP and a strategy of buying a term insurance policy and investing the difference between the cost of the term insurance policy and SBP. If positive, the term/invest policy has a higher payout than SBP. The term and invest strategy assumes an $800,000 30-year policy costing $125/month, 3% return on investments, and 2.5% inflation. Panel C: Expected payout difference between the term-and-invest strategy and SBP. This plot shows, for a variety of probabilistically determined mortality combinations, the difference in payouts between SBP and a strategy of buying a term insurance policy and investing the difference between the cost of the term insurance policy and SBP. If positive, the term/invest policy has a higher expected payout than SBP. The term and invest strategy assumes an $800,000 30-year policy costing $125/month, 3% return on investments, and 2.5% inflation.

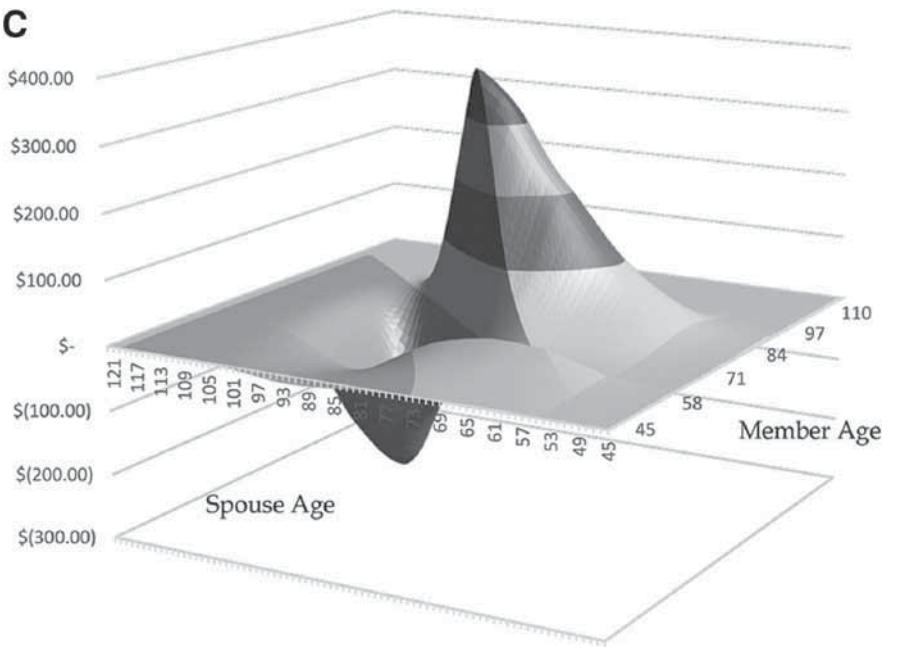

Fig. 5. *(continued).*

provide some financial support. Additionally, by investing, a retiree becomes self-insured much later in life because of the compounded investment returns (see the ramp as the member's age increases). Overall, during the highest-probability mortality combinations, the term-and-invest strategy is preferred over the SBP DB insurance program.

Critically, unlike the SBP, *the value of the term insurance and the investments remains intact even if the spouse dies*. That is, the term policy and investments are available to children, charities, or any future beneficiaries. Besides covering the retiree's family during the vital early years, the term-and-invest option provides almost certain non-negative future wealth, regardless of the mortality order of the retiree and spouse. Finally, and very importantly, these values represent the marginal benefits (and costs) of the term-and-invest strategy relative to SBP. Even in those mortality combinations where the term-and-invest strategy underperforms relative to the SBP strategy, it does *not* mean the military retiree's spouse is without financial resources. On the contrary, Fig. 5, Panel A shows that in these very scenarios the widow does indeed receive positive payouts in many of the scenarios. The reason these payouts are negative in Panel B is because the payouts in the SBP winner scenario are exceedingly high. In summary, relative to SBP, a term-and-invest strategy has many advantages.

To recap the two options succinctly, for the couple identified here, there is a 60% probability they will pay into SBP more than they ever receive, despite the program's government subsidy and despite the program's expected positive real returns. Conditional upon falling into this 60% net loss scenario, the couple can expect a net "loss" of $55,232. On the other hand, if they happen to see any SBP payout, which has a 40% probability of occurring, their conditional expected payout is $116,500. While this proposition might sound reasonable in isolation for an insurance product, it loses appeal relative to the term-and-invest alternative. In the same 60% of the time that the couple would lose with SBP, their conditional expected payout under term-and-invest is $85,421; for the 40% of the time that

	Retiree Age (Monthly Term Policy Premium, $800,000 coverage, 30-year level term) (Monthly Whole Life Policy Premium, $800,000 coverage, 20-year payments)			
	36 ($68)	40 ($90)	44 ($125)	48 ($120*, *20-year term)
Spouse Age	($1,000)	($1,183)	($1,320)	($1,547)
	$100,646 E(SBP)	180,186	284,951	416,331
32	$123,377 E(T&I)	142.005	162.214	144,895
	49% Pr(SBP>0)	60%	70%	78%
	50,128	111,829	198,204	311,885
36	123,377	142,005	162,214	144,895
	38%	49%	60%	70%
	11,461	55,698	123,012	217,849
40	123,377	142,005	162,214	144,895
	28%	38%	49%	60%
	-15,539	12,734	61,268	136,629
44	123,377	142,005	162,214	144,895
	19%	28%	38%	49%
	-32,159	-17,266	14,007	70,282
48	123,377	142,005	162,214	144,895
	13%	19%	28%	38%
	-40,732	-35,732	-18,992	20,022
52	123,377	142,005	162,214	144,895
	8%	13%	19%	28%
Amount of Retiree Pay insured	45,000	50,000	55,000	60,000

Fig. 6. Expected value of Survivor Benefit Plan (SBP) for various retiree-spouse age combinations at retirement. This table shows the expected value based on life expectancies for the SBP program available to military retirees and their spouses, E(SBP). It also shows the expected value for a term insurance plus investment strategy, E(T&I), where commercial level term life insurance is purchased and the difference between these premiums and SBP premiums is invested in risk-free treasuries. It also shows the probability that the couple will receive SBP payouts that surpass premiums, Pr(SBP $>$ 0). The age combinations represent the retiree and spouse ages at the time of retirement. The final row shows the amount of annual retirement pay the retiree insures. Shaded cells represent retiree-spouse combinations where the expected SBP payout is greater than the expected term plus investment payout, or E(SBP) $>$ E(T&I).

SBP pays off positively, term-and-invest pays off as well, with $76,792. All of these figures involve comparable risk, which is the appropriate way to analyze financial decisions. Predictably, the differences become even more biased toward the term-and-invest strategy's benefit if one posits real investment returns higher than 0.49%.[16]

Having quantified the most common retiree and spouse scenario and presented the case for a term-and-invest strategy, it is important to understand there are cases where SBP clearly makes financial sense. Using the same methodology presented in the previous scenario, Fig. 6 summarizes other selected officer retiree-spouse age combinations at retirement. With estimates of term insurance premiums and insured SBP coverage amounts, it provides the expected values of SBP and the term-and-invest strategy, along with the probability of receiving more from SBP than paid in premiums. Given the relative life expectancies, it is evident that military retirees with younger spouses should strongly consider purchasing the SBP program. The shaded combinations show the retiree-spouse age combinations where the expected payout to SBP exceeds that of a possible term-and-invest strategy. If a retiree and spouse differ in age by approximately six years, they will want to look closely at SBP, as eight (four) years difference makes SBP (term-and-invest) the dominant strategy.

5.3. Mentor those junior to you about the SBP decision

For those with clients who have already chosen SBP, it is important to stress that it is not an ineffective or malicious program. It does provide income protection for the spouse should the retiree predecease the spouse. SBP is an annuitization strategy that goes a long way in addressing the longevity risk of a surviving spouse. For many, SBP is a viable solution to the annuity puzzle, where too few retirees annuitize retirement wealth as life cycle models would suggest they should (Yaari, 1965). SBP largely addresses an inadequacy in life insurance that leaves many widows experiencing a dramatic reduction in standard of living (Auerbach and Kotlikoff, 1991).

With potentially better options available to military retirees, we want to urge mentorship of future generations about their choices. The FINRA (FINRA Investor Education Foundation, 2012) study entitled, "Financial Capability in the United States, 2012 Report of Military Findings," finds that many active military members fail to plan for retirement. Sharing this SBP analysis with individuals earlier in the preretirement phase of their careers may be beneficial. In some cases, doing so will allow them to buy level-term insurance at lower rates and while they are insurable. As good as they are at strategic, operational, and tactical military planning, many military members allow retirement planning—including the SBP decision—to flank them. We posit that young workers with private DB plans could benefit from similar mentoring.

Finally, conflicting incentives converge at retirement, making an early insurance decision even more important. Typically, military members are incentivized to report every ailment at retirement for disability qualification purposes under Veterans' Administration (VA) benefits programs. Some of these ailments could clearly affect one's insurability for any program besides SBP or the military's term insurance counterpart, Veterans' Group Life Insurance (VGLI), neither of which requires a medical exam. Therefore, making the "to SBP or not SBP" decision earlier could prove tremendously beneficial beyond the figures shown here. We recommend that service members specifically—and DB recipients more generally—consider the pension insurance decision two to five years before retirement.

6. Caveats and additional considerations

We have presented a scenario-based analysis using the most common officer retirement scenario. This means unambiguously that our recommendations are not one-size fits all. Instead, they come with the following caveats and additional considerations. The online calculator provides individual-specific insights that this paper does not depict.

6.1. Competent financial planning

First and foremost, this SBP decision is a tactical one that is part of an individual's and family's broader financial strategy. Having a comprehensive strategy is absolutely critical and the SBP decision should complement this bigger picture. It would be tragic to see

destitute war widows and widowers win the tactical financial skirmish but lose the broader campaign.

6.2. Taxes

As mentioned earlier, our analysis ignores taxes. The basis for this decision is that SBP premiums are paid pretax, yet benefits are taxed. Conversely, term life insurance payments are taxed; the proceeds are not. The tax status of investments varies based on whether they are in tax-advantaged retirement accounts or not, and if so, which flavor (e.g., traditional or Roth). For these reasons, we urge readers to perform a situation-specific tax analysis before making any final decisions.[17] See the prior recommendation.

6.3. Personal differences

Clearly our scenario-based analysis analyzes a particular couple—again, we understand it to be the most common officer retiree scenario inasmuch as one exists. Obviously, individual retiree and spouse health at retirement varies and the couple's mortality expectations can deviate significantly—both positively and negatively—from the actuarial table estimates. For instance, because of a medical condition, it is possible the retiree cannot get private insurance. One needs to make this determination before declining SBP.

6.4. Age differences

Marked age differences can certainly swing this analysis in favor of the SBP decision, particularly if the retiree is a male married to a much younger female spouse. In that case it is more likely that the male retiree will predecease his spouse, generating much higher expected payoffs to the spousal beneficiary. Fig. 6, as well as our online calculator can help here.

6.5. Children

Along similar lines as the previous caveat, retirees with young children can consider opting for the child-only benefit portion of the SBP. This a la carte option permits the retiree to buy SBP at a very low rate (e.g., on the order of $10–$20 per month) with children as the beneficiaries. Eligible children share the full 55% benefit equally until they turn 18, or 22 if a student, at which time they become ineligible. If both spouse and child benefits are elected, then children are not eligible for these benefits until the spouse is ineligible through remarriage or death. In short, when a retiree's youngest child is very young, the SBP child option can serve as an inexpensive partial substitute for the private insurance coverage in the term-and-invest option we present. Notably, untabulated analysis shows the child-only coverage is not actuarially favorable to participants; however, the premiums can be a small price to pay for the peace of mind this coverage provides.

6.6. The "talk"

As discussed early on, the SBP is an opt-out program. A married member who wishes to decline coverage must get their spouse's approval, whereby the spouse recognizes this decision to forego the annuity upon the member's death. Anecdotally, we cannot overstate the difficulties associated with this decision if a couple has not had prior conversations about their plans. As part of this talk, a spouse must recognize the potential implications of foregoing SBP. For instance, if a couple declines SBP and subsequently divorces, the spouse could lose control over the insurance and investments unless they protect themselves carefully in the divorce proceedings. It is important the spouse recognize this potential liability. Narrowly, we recommend conversing with one's spouse early about the SBP decision. More broadly, we encourage couples to discuss general financial planning matters early and often!

6.7. Investment and budgetary discipline

Discussing this article with others, including insurance sales representatives, made us consider putting this item first on the list. As one astute reviewer highlighted, the term-and-invest alternative depicted here relies on the invest component of the strategy, particularly later on when returns are compounded over decades. Behaviorally, it takes discipline to keep investing the difference versus enhancing one's quality of life. Unfortunately, for some individuals it is very easy to stop paying a term policy premium or stop investing the difference if a new car or house upgrade beckons. If a couple is not committed to investing the difference, then they might consider SBP more carefully. Despite the low return (i.e., risk-free rate) assumptions in our scenario, the investments represent fully 75% of the term-and-invest strategy's value. Thus, a term insurance only strategy underperforms SBP ($40,700 expected payout vs. $61,300 for SBP), which is not surprising given the SBP subsidy. The real surprise is that a competitively priced life insurance policy from a reputable insurer competes quite well with SBP at this time. Furthermore, if allowed to deviate from risk-equivalent returns, a broad market portfolio of investments will perform much better over decades than shown in our analysis. Additionally, a beneficiary of a lump-sum insurance payout requires budgetary discipline to ensure the funds last as if they were an annuity. Financial advisors can assist with this discipline aspect . . . again, see the first recommendation.

6.8. Assumptions

We make known our assumptions about our scenario, interest rates, and inflation. However, we must add this item for completeness. Of course, the outcomes are sensitive to these assumptions. Caveated sufficiently, we do stress that the essence of our recommendations are not highly sensitive to changes in these assumptions.

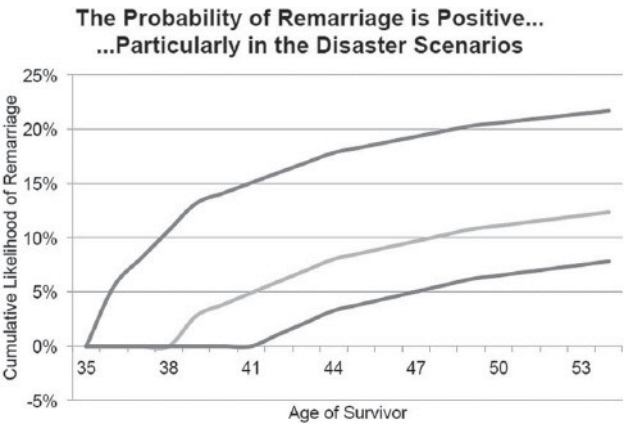

Fig. 7. Probability of a widowed spouse remarriage. This plot shows the probability of a widowed military spouse remarrying at a given age conditional upon the age at which they were widowed (i.e., 35-, 38-, or 41-years-old). If remarrying before age 55, a widowed spouse foregoes future Survivor Benefit Plan (SBP) benefits.

6.9. Marital status

The younger a widow(er), the more likely he or she is to remarry. Fig. 7 shows these probabilities. If an SBP recipient widow(er) remarries before age 55, then the SBP benefit disappears. Consequently, if we added these probabilities of remarriage into this analysis, the expected payouts to the winners (i.e., the long-lived spouse whose SBP-insured spouse died young) would decrease. Adding this caveat would on-balance, enhance the appeal of the term-and-invest strategy relative to SBP. For divorced retirees, Higdon (2009) outlines multiple family law cases involving SBP. Another application of this analysis results from these legal situations: divorced service members might find a level-term life insurance policy a more financially appealing way to provide for their ex-spouse's insurable interest in the service member's retirement pay.

6.10. Credit quality (both ways)

Directly comparing our term-and-invest strategy with SBP assumes the private insurer has credit quality equal to the U.S. government. We could avoid this assumption by adjusting the insurance payouts with a discount rate reflecting this risk. We have chosen not to do so at this time because (1) the private insurers we quote have top ratings and (2) we do not think using such a discount rate would necessarily obviate any related criticism.

6.11. Female military member

For brevity, this article focused on the most common member-spouse gender scenario; clearly others exist. Obtaining by-gender mortality data from the DoD Actuary would facilitate this relevant analysis. Given the relative longevity of military members versus their spouses along with the typical male-female age differences in marriage we suspect that our term-and-invest strategy dominates SBP in many female military member cases.

6.12. Death Indemnity Compensation (DIC) offset and Servicemembers Group Life Insurance (SGLI)

Currently, the government's Death Indemnity Compensation program compensates beneficiaries of military members who die while on active duty or from a disability compensable under Veterans Administration laws. This DIC currently offsets spousal SBP payments dollar-for-dollar such that in the aggregate beneficiaries receive up to the maximum of either DIC or SBP benefits. We have excluded this DIC offset impact in our analysis. However, if we included it, SBP becomes even less appealing than we portray here, as it is theoretically possible to pay SBP premiums but never receive an SBP benefit if the DIC maximum payment subsumes the SBP benefits. Recent military compensation reform proposals recommend allowing retirees the option of removing this offset; however, in doing so retirees would pay higher SBP premiums. The net effect can be addressed when it materializes. Relatedly, servicemembers should know that their SGLI coverage that they carry on active duty continues for 120 days after retirement at no cost. Currently, the maximum coverage is $400,000. We do not model this coverage, but if we did, it would temper the relative benefit of SBP (or strengthen the term-and-invest option) in those scenarios where the servicemember dies within four months of retirement.

7. Conclusion

Tens of millions of retirees—state employees, federal employees, and even private DB pensioners—face decisions about whether and how to insure their defined benefit pension. The U.S. military has a transparent and well-defined pension protection program called the SBP. The SBP presents a unique opportunity to present a framework for analyzing this key financial decision. Prior analysis has simulated the payoffs for various scenarios, ultimately concluding that the SBPs average real return is quite remarkable, between six and seven percentage for a common scenario. While we concur that this average return makes the SBP program very attractive, we update the results using more relevant and appropriate life expectancy data. We show that a 1-in-20 winner scenario is embedded in any rate of return calculation, masking the highly skewed distribution of outcomes. We ultimately recommend a default position against the federally-insured pension protection program for the typical retiree given currently available market alternatives.

One alternative that is currently more appropriate for the typical military retiree considering SBP-like programs is to buy privately-available level-term insurance and invest the difference between the term cost and the SBP premiums. Based on an illustration of a common retiree-spouse combination and risk-equivalent return assumptions, a strategy of buying term insurance and investing the savings generally provides more preferred outcomes than SBP.

Our analysis couples the Department of Defense Actuary life expectancy tables with realistic demographic and economic assumptions to first determine the expected payoffs to the SBP program. It turns out that over 60% of SBP clients should expect to pay more in premiums than they ever receive. While we might anticipate this breadth of expected negative returns with private insurers because of profit and overhead requirements, it is somewhat surprising

Instructions (Change ONLY items in green cells)	
Retiree Category (select Officer or Enlisted)	Officer
Retiree Status (select Active or Reserve)	Active
Retiree Current Age, at least 35	44
Spouse Current Age, at least 30	44
Retiree Retirement Age (at least 35 & at least Current Age)	44
Age of Youngest Child at Retirement	9
Age you expect SBP Child Benefit to end (18 or 22)	22
Inflation (%)	2.50%
Investment Return (%)	7.00%
Amount (annual) of Military Retirement Pay Insured by SBP ($)	$ 55,000.00
Monthly Term Insurance Premium (Private Company, $)	$ 125.00
Term of Private Term Insurance (Years)	30
Term Policy Face Value ($)	$ 800,000.00
Real Risk-Free Interest Rate (%, default: keep at zero)	0.00%

Calculations (Do Not Change)	
Spouse Age at Retirement	44
Annual Term Insurance Premium ($)	$ 1,500.00
Monthly SBP Premium, Spouse ($)	$ 297.92
Monthly SBP Premium, Child ($, per thousand of coverage)	$ 10.08
Annual SBP Premium, Spouse ($)	$ 3,575.00
Annual SBP Premium, Child ($)	$ 121.00
Real Investment Return Rate (Fisher)	4.39%
Monthly Investment "Term & Invest"	$ 172.92
Monthly Investment "Term & Invest" w/ Child-only SBP	$ 162.83
Annual SBP Payout (Real $)	$ 30,250.00

Probability-Weighted Value of SBP vs. Term & Invest Strategies	
Probability of Receiving any net SBP Payout	37.92%
Expected SBP Payout (Pr * Payout)	$ 61,268
Probability of Receiving any Term & Invest Payout*	100.00%
Expected Term & Invest Payout (Pr * Payout)	$ 331,000
Delta (Term & Invest - SBP)	$ 269,733
Percent of Mortality Combinations where SBP > Term & Invest	16.16%
Probability of Receiving any Term & Child SBP & Invest Payout**	100.00%
Expected Term & Child SBP & Invest Payout	$ 593,885
Delta (Term & Child SBP & Invest - SBP)	$ 532,618
Percent of Mortality Combinations where SBP > Term/Child/Invest	14.72%
*Assumes Investment balance at end of term policy is not lost	
**Assumes Investment balance at end of term policy is not lost; assumes child outlives parents	

Fig. 8. Results from Survivor Benefit Plan (SBP) calculator for one common scenario. This figure shows the inputs available and output summary from a calculator that permits individuals to assess the SBP versus term-and-invest pension protection strategies given their unique circumstances. Results are based on military-retiree specific mortality tables. Calculator is available at www.financialcheckpoints.com.

given the SBP is federally subsidized and endorsed. Further, the SBP insures relatively healthy individuals—U.S. military members who have served at least 20 years—as evidenced by their required preventive health exams and routine physical fitness tests.

This study further characterizes the expected SBP winners versus typical recipients, finding that while the winners (i.e., the insured dies young and the beneficiary lives long) occur only a small fraction of the time (5%), almost 60% of the SBPs expected value goes to the surviving spouse in these couples (as noted in the paper, we do not mean literal

winners. We genuinely hope nobody "wins" early SBP payments). In contrast, the typical SBP recipients receive their payouts relatively late in the game for relatively few years, at a time when they likely have other sources of income besides the SBP annuity.

For these reasons, we explore an alternative to SBP, which is buying term insurance and investing the difference between the cost of the term policy and the SBP premium. This term-and-invest strategy is superior to the SBP in many situations. It protects the surviving spouse from an unexpected early death of the insured retiree. Unlike SBP, the term insurance policy benefits are not conditional upon the beneficiary spouse's mortality. In other words, children, charities, or the retiree's estate will still benefit if the retiree's spouse passes away. The investments also provide a certain benefit to the spouse, children, or couple whether the retiree predeceases them early or not. In fact, in a common scenario of a 44-year-old male military officer retiring with great health and under plausible nominal investment return (7%) and inflation (2.5%) assumptions, the expected payout to a term-and-invest strategy is $330,000, which is over five times the expected payout from SBP. A summary of various scenarios is found in Fig. 6, which comes from our calculator that we provide online. Fig. 8 shows a snapshot of this calculator.

In closing, it is universally important to recognize certain things about SBP:

- The expected returns are more skewed than previously documented,
- Well over one-half of retirees in common situations are expected to pay more in premiums than their spouse collects;
- From a holistic financial planning perspective, the most likely mortality scenarios make SBP largely irrelevant; and
- In circumstances where SBP is most valuable, there exist other mechanisms to provide similar, or even enhanced, financial security.

Yet, because of the caveats we list, which include taxes, individual-unique circumstances, behavioral considerations, our assumptions, and so forth, the SBP decision is truly situation-specific. Therefore, we recommend readers use this article's framework as a baseline for discussing this important topic with their own clients or planners before making a potentially life-altering decision. We recommend having this conversation two to five years before retirement. For our part, we are eating our own cooking: those of us who are eligible have purchased term life policies and declined SBP.[18]

Notes

1 The analysis in this article clearly assumes that the couple needs to protect the DB recipient's pension out of a need for the income replacement. This would not be the case if, for instance, the couple had substantial wealth (e.g., recent inheritance or longstanding trust) or income (e.g., spouse earns high income independently) that would provide for the family's needs upon the death of the DB recipient.

2 Although the outcome is still an actuarial loss to the military retiree, the one exception we would recommend is strong consideration of the a la carte child coverage when military retirees have young children.

3 This option is now changing under the new Blended Retirement System. For analysis of this new option, see Payne et al, 2018.

4 While lesser amounts of coverage for the beneficiary are possible, it is worth comparing the benefits of comparable private insurance that we describe later. Details on this lesser coverage and benefit appear here: http://militarypay.defense.gov/Benefits/Survivor-Benefit-Program/Costs-and-Benefits/Spouse-Coverage/.

5 Source: "Valuation of the Military Retirement System," September 30, 2013 and revised January 2015, produced by the Department of Defense (DoD) Actuary (Department of Defense Office of the Actuary, 2013). Note that we had to extrapolate mortality probabilities for retirees beyond age 109, as that is the age the DoD Actuary ended its tables. We assumed a maximum lifespan of 120 years, with exceedingly low probabilities of living beyond 109. Our extension was informed by SOA RP-2014. We obtained Social Security data from the Social Sec. Office of the Chief Actuary 2014.

6 http://actuary.defense.gov/, "Statistical Report on the Military Retirement System-September 30, 2013," Table: Military Retirees by Gender and Branch of Service as of September 30, 2013.

7 http://www.militaryonesource.mil/12038/MOS/Reports/2012_Demographics_Report.pdf, "2012 Demographics: Profile of the Military Community," Table 2.57: Number and Percentage of Active Duty Officers and Enlisted Members in Dual-Military Marriages by Service Branch.

8 Some (e.g., Jennings and Reichenstein, 2003) might argue we should use the TIPS rate for the real discount rate; however, staying on the other side of that argument makes our analysis more conservative (i.e., more favorable to SBP than it would be if we used a TIPS rate). The online calculator permits the user to make this adjustment.

9 For the officer, monthly premiums equal 6.5% × \$55,000/12 = \$297.92 × 72 months = \$21,450. Annual benefits are 55% × \$55,000 = \$30,250 × 20 years = \$605,000. The enlisted calculations are identical, except they begin with a \$2,100 per month pension benefit.

10 For benefits to outweigh costs, the ratio of *spouse lifespan after retiree death/insured retiree lifespan after retirement* must be greater than the ratio of *total premiums = 6.5%/total benefits = 55%*, which equals 0.12. Thus, the spouse lifespan after retiree death must be greater than 0.12 × insured retiree's lifespan as a military pension recipient and SBP premium payer.

11 http://militarypay.defense.gov/Benefits/Survivor-Benefit-Program/Overview/

12 Because Pfau (2015) makes a compelling case for considering whole life insurance as a part of holistic retirement planning, we emphasize our recommendation that couples seek competent financial advice when considering this option.

13 As an astute reviewer pointed out, if one were not comfortable assuming a 3.5–4% payout assumption since Bengen (1994) evaluates a risky investment portfolio, then doing so would require upward adjustments for insurance premiums and downward adjustments for the invested difference relative to what we present here. We do not explore these alternatives in this analysis, but they are easy to compute using the accompanying online calculator. The authors could also provide them upon request.

14 We also calibrated these costs with a broad group of general life insurance providers to ensure their reasonableness. The military-centric coverage is more expensive, presumably because of the consideration of such factors as high-risk work and the absence of war exclusion clauses. Evaluating military-specific policies is, therefore, conservative.
15 We assume 2.5% inflation and 3% return on investments for a 0.49% real return on investments. Doing so is consistent with the Jennings and Reichenstein (2003) approach to valuing defined benefit pensions. Note the results are relatively less sensitive to these return assumptions than they are to the insurance coverage amount, term, and cost.
16 For instance, assuming a reasonable investment portfolio return of 7% (4.39% real), the conditional expected payouts for the term-and-invest scenario become $125,665 and $205,335 in the 40% and 60% spaces, respectively, for a total expected payout to term-and-invest of $331,000.
17 Using the illustrative example in the article, we assume a 25% pre-death income tax rate (federal and state), 17% post-death income tax rate (federal and state), and 15% capital gains rate and that any investments are in non-tax-advantaged accounts. Under these conditions, the expected value of SBP decreases by $2,620 or 4.3% while the expected value of term-and-invest decreases by $3,465 or 2.1%. The magnitude of the tax impacts is similar under both options. Obviously, there are countless permutations based on individual circumstances, leading us back to the first consideration in this list.
18 Full disclosure: one of us with young children opted for the child-only option.

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