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AN ANALYSIS OF BENEFIT DISTRIBUTION OPTIONS SELECTED BY INDIVIDUALS
COVERED BY THE PBGC

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ABSTRACT

The Pension Benefit Guarantee Corporation becomes the trustee for private defined benefit plans that have defaulted. The PBGC pays retirement benefits as provided by the plan and that are consistent with federal guidelines concerning the type and amounts of distributions. In response to a Freedom of Information Request, the PBGC provided us with relevant information on all individuals who received a retirement benefit from the PBGC in the last 10 years, over 250,000 retirees. We examine the PBGC distributions chosen over the last decade and how they vary by age at retirement, sex, months of service, and other relevant variables. Key findings indicate that men are much more likely to choose a joint and survivor annuity compared to female claimants and the difference increases with age. Conditional on selecting a J&S annuity, men are more likely to select a 100% survivor's annuity while women tend to choose a 50% survivor's benefit.

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An important concern for participants in defined benefit (DB) pension plans is whether their plans will have sufficient funds to pay promised benefits. In the wake of a series of corporate bankruptcies where pension plans were underfunded and thus unable to pay all promised benefits, Congress enacted the Employee Retirement Income Security Act (ERISA) in 1974 and established the Pension Benefit Guaranty Corporation (PBGC). Under this legislation, the PBGC guarantees that vested pension benefits will be paid to participants in covered DB plans.

For the millions of Americans, including those who are covered by terminated DB plans, one of the most important economic decisions they face is how to access the monthly benefits promised by the plan. Distribution options offered by DB plans are governed by federal regulations. The monthly benefit is typically determined using a benefit formula based on the employee's years of service and final earnings. The formula produces the monthly benefit a retiree would receive as a straight-life annuity with no survivor benefits; however, DB plans also provide a range of other payout options including a variety of joint-and-survivor annuities and often a lump sum distribution. In most cases, benefit choices at retirement are irreversible (BLS, 2003).

Similar to on-going DB plans, plans managed by the PBGC provide claimants with a series of distribution options. If an individual has claimed benefits prior to the PBGC assuming the management of the plan, retiring workers could have selected any of the distribution options offered by the plan. Once the PBGC becomes the trustee of the plan, distribution options are limited to those offered by the PBGC and may be subject to a maximum monthly benefit. In general, DB plans offer a straight-life annuity for the retirees and a series of other forms of annuities that provide for income protection for spouses or other beneficiaries. For an individual

plan participant, choosing a straight-life annuity provides the maximum monthly benefit; however, this option does not provide any continuing retirement benefit for surviving spouses. Joint-and-survivor annuities provide survivor benefits but this assurance comes at the cost of a lower monthly benefit throughout retirement.

In this paper, we examine the distribution choices of individuals claiming benefits from PBGC-managed DB plans between 2012 and 2021. The analysis uses administrative data provided by the PBGC and shows considerable variation by individual characteristics. In the first section, we describe how the PBGC operates and the extent of its coverage. Section II describes the payout options offered by DB plans and factors that influence worker preferences for various payout methods. Section III reviews the data provided by the PBGC and the menu of distribution options offered by the PBGC. In Section IV, we examine the choices made by PBGC retirees and how they vary by age, sex, and over time. Marginal effects of the determinants of distribution choices are reported in Section V and in Section VI, we examine the level of monthly benefits paid by the PBGC.

I. The PBGC and the Benefit Protection It Provides

The PBGC was established by the Employee Retirement Income Security Act of 1974. The goal of the PBGC is to protect the retirement incomes of Americans who participate in private sector defined benefit pension plans if the firm defaults on its pension obligations (PBGC, 2023a).¹ The PBGC covers both single-employer and multiemployer DB plans; however, the two types of plans are managed in separate programs within the PBGC. The program covering single employers assumes responsibility for terminated plans of failing firms

¹Only private sector DB plans are covered by ERISA, and hence, the PBGC. State and local DB plans are not covered by the terms of ERISA.

and pays benefits directly to retirees of these plans. Instead of making direct payments to retirees in multi-employer plans, the PBGC provides financial assistance to the plans that are failing. In this paper, we examine only the payout options chosen by participants in single-employer plans.

The single-employer program covers most defined benefit plans that are sponsored by an individual employer in the private sector of the U.S. economy. Employers who offer a DB retirement plan must pay the PBGC a flat-rate insurance premium based on the number of participants. Underfunded single-employer plans pay an additional variable-rate premium based on the amount of unfunded vested benefits. When a firm terminates an underfunded DB plan, the plan's assets and liabilities are transferred to the PBGC which has the responsibility to pay vested benefits of participants in the plan up to legal limits.² The transfer of plans to the PBGC typically occurs when an employer sponsoring an underfunded plan liquidates in bankruptcy, ceases operation, or can no longer afford to maintain the plan.³ At this point, the PBGC takes over the plan's assets, administration, and payment of benefits. The retirement benefit paid by the PBGC is determined by the provisions of the individual pension plan in which the employee participated. For the worker's benefit to be fully insured, the benefit must have been vested before the plan terminated as the PBGC provisions guarantee only not forfeitable benefits

In FY 2022, the PBGC provided insurance coverage to 22.3 million workers in 23,800 single-employer DB plans along with 11.2 million employees covered by 1,360 multi-employer

² ERISA mandated a maximum guaranteed benefit that can be paid by the PBGC. In 2021, the maximum guaranteed benefit was \$72,409. This maximum is adjusted annually based on changes in the Social Security wage base (PBGC, 2019a, Table S-53). It is important to note that the maximum benefit is a cap on what PBGC guarantees, not the amount that the PBGC pays. When a plan transferred to the PBGC has sufficient assets to pay all vested benefits, the PBGC can pay monthly benefits in excess of the maximum guarantee benefit (PBGC, 2022).

³The top 10 firms that could no longer meet their pension obligations that presented claims to the PBGC since 1974 are United Airlines, Delphi, Bethlehem Steel, US Airways, LTV Steel, Delta Airlines, Sears Holdings, National Steel, Avaya, and Pan American Airlines. Sears Holdings and Avaya from this list match our dataset timing. (PBGC, 2019a, Table S-5).

plans (PBGC, 2023b). In FY 2022, the PBGC assumed control for 32 plans that covered nearly 8,000 current and future retirees. In total, the PBGC paid over \$7.0 billion in benefits to more than 960,000 retirees during FY 2022, (PBGC, 2022).

The number of PBGC insured active participants as a percent of private sector wage and salary workers has steadily decreased since 1980. The percentage of private sector workers covered by the single-employer PBGC covered plan was 28.8% in 1980; however, by 2000, coverage by the PBGC had declined to 16.4% of such employees. Coverage fell further to 7.3% employees in 2018. This decline reflects the decline in the incidence of defined benefit plans among private employers (PBGC, 2019a, Table S-33). In 1985, the total number of insured plans was 112,208 compared to 35,375 in 2000 and 23,477 in 2020 (PBGC, 2019a, Table S31). The majority of plans, 61%, insured by the PBGC are in the manufacturing industry, while 18% are in transportation and public utilities (PBGC, 2019a, Table S-29).

When the PBGC assumes responsibility for a plan, some participants have already retired from their employer and are receiving a pension benefit under the provisions of the terminated plan. The remainder of participants in the plan have yet to start receiving benefits and will only claim a benefit after the PBGC has assumed responsibility for paying retirement benefits to plan participants. Participants in a failed plan that have not yet claimed a retirement benefit have the option of selecting a distribution method from a menu of options available through the PBGC and those offered by the terminated plan. These benefits are subject to a maximum benefit amount. The maximum monthly guarantee in 1990 was \$2,167, \$3,222 in 2000, and \$6, 034 in 2021 (PBGC, 2019a, Table S-53). The benefit cap affects only a small proportion of participants.

A study by the PBGC found that 84 percent of participants receive 100 percent of the vested benefits (PBGC,2019b).⁴

Unlike many defined benefit plans, the PBGC does not allow retirees to select lump sum distributions of their pension benefits.⁵ We presume, this restriction reflects the preference of policy makers that annuities are preferred to lump sum distributions of pension wealth.

Our primary objective is to examine the distribution choices of participants in terminated DB plans that have been taken over by the PBGC and to determine how these choices differ across retiree economic and demographic characteristics. We also examine whether the distribution choices from PBGC plans have changed over the past decade.

II. Determinates of Distribution Choices

In DB plans, benefits are usually specified as a straight-life annuity where monthly benefits are determined by a formula that generally is based on years of service, final average salary, and a generosity factor. Plans have a normal retirement age which is the age when the

⁴ The average reduction for individuals affected by the benefit cap was 24%. Interestingly, the limit on monthly benefits was concentrated on individuals in a few firms as 89% of reductions were in 10 firms (PBGC, 2019b). Reductions were most often the results of three guarantee limitations. The Accrued-at-Normal Limitation constrains the PBGC guarantees to a monthly amount no greater than the monthly benefit provided as a straight life annuity available at the plan's normal retirement age. The Maximum Insurance Limitation places a dollar cap on the benefits PBGC guarantees. This limit is tied to the year the underfunded plan terminates. The Phase-in Limitation applies to plan amendments. The PBGC fully covers benefit improvements that were both adopted and effective more than five years prior to the date of the plan's termination. It does not cover any benefit increase implemented through a plan amendment that was made within one year of the date of the plan termination and it covers partial enhancements for those amendments that occurred greater than one year from plan termination but less than five years from plan termination. The largest number of reductions, or 9% of the 16%, was due to phase in limitations. The largest dollar impact was due to the maximum insurance limitation for a 33 percent reduction compared to the average the benefit reduction of 23 percent.

⁵ The PBGC does allow the payment of a lump sum if the benefit value is \$5,000 or less. These small lump sum distributions can usually be transferred into a traditional Individual Retirement Arrangement (IRA) or other qualified plans.

worker can retire and receive an unreduced benefit. Most DB plans also offer a reduced benefit that can begin at an earlier age. Plans are required by federal regulations to offer a joint-and-survivor (J&S) option as the default distribution for married workers. The J&S benefit is based on the present value of the straight life annuity with the monthly J&S benefit being determined using an appropriate interest rate and mortality tables. The retiree can select the straight-life benefit, if their spouse agrees to waive the J&S benefit.⁶ A majority of DB plans also offer a lump sum option where the retiree is paid the present value of the straight life annuity.

Relative Value of Benefit Options

It is important to note that the monthly benefit associated with a straight-life annuity for the worker is based on the benefit formula specified by the plan. Once the participant has reached the age for normal retirement, the monthly benefit typically is not a function of age. Thus, workers claiming a benefit at age 60 receive the same monthly benefit as workers retiring at age 65 if they have the same number of years of service and the same final average salary. While the monthly benefit does not vary with age at retirement, the present value of the annuity differs based on the age at retirement.

When determining the benefit for other distribution options, plan actuaries first calculate the present value of the straight-life annuity and then derive the monthly benefit associated with the chosen option so that it has the same present value. These calculations use a unisex mortality so the monthly benefit for a J&S annuity does not reflect sex differences in life expectancy but the benefit does vary by the age of the retiree and the age of the designated beneficiary. Holding age constant, women have the longer life expectancy compared to men. As a result, the unisex

⁶ While the designated beneficiary in J&S options is usually a spouse, the retiree can select other individuals to be their beneficiary.

life table underestimates the present value of a straight life annuity for women and tends to reduce the value of the monthly J&S annuity. Thus, we would expect that on average, women will be more likely to accept the straight-life annuity and less likely to request a J&S distribution. This preference for the straight-life annuity may be enhanced if women are more likely to be married to men with higher earnings, who are older, and who are more likely to be covered by their own retirement plan.

Individuals with higher personal discount rates place greater value on money in the early retirement years relative to benefits years in the future. Thus, individuals with higher rates of discount are expected to favor a straight life annuity instead of a J&S annuity. In general, individuals will have better information about their health and personal life expectancy relative to the life expectancy used by the plan. When considering the straight-life annuity and J&S annuity, retirees will be more likely to choose a J&S annuity if they have fewer years of life expectancy and are married to spouses with high life expectancy. Of course, married individuals will be more likely to prefer a J&S option because of the protection it provides to the surviving spouse.

Factors Affecting the Choice of Distributions

Most prior studies of the choice of pension distributions have focused on the choice between lump sum distributions and some other type of annuity.⁷ Given that the PBGC does not allow for lump sum distributions, we focus on papers that examine the choices of individuals across other types of payout options. We are unaware of any other studies that examine the

⁷ For example, see Banerjee (2013), Brown (2001), Benartzi, et al (2011), Butler and Teppe (2007), Clark and Mitchell (2022).

distribution choices of retirees from PBGC managed retirement plans; however, there are a few articles that focused on the distribution choices of participants in DB plans.

Clark et al (2019) examined distribution choices by retirees from the North Carolina state retirement plan for teachers and state employees. Using survey data combined with administrative records, they found that relatively few retirees select lump sum distributions and so most retirees select some type of annuity. Men were 14 percentage points more likely to choose a J&S benefit than women. Other findings included that older workers, those in good health, those that had greater life expectancy, and Blacks were less likely to choose a J&S benefit. Individuals with greater financial literacy and those whose spouse had greater life expectancy were more likely to have chosen a J&S annuity.

A recent study by Brown et al, (2022) examines the distributional choices of retirees covered by TIAA who have not taken a lump sum distribution of account balances from a defined contribution plan. Their analysis examines trends between 2000 and 2018 in the type of distributions requested including straight-life annuities, J&S annuities, required minimum distributions, and fixed monthly payouts. They find that the average age of retirees in the sample rose by 1.3 years for women and 2.0 years for men. Among these retirees, individuals were postponing initial distributions to older ages and fewer claimants were requesting one of the annuity options offered by TIAA. Instead, they were making periodic withdrawals as mandated by the minimum distribution requirements under federal regulations. Clark and Mitchell (2022) show that participants in DC plans are much less likely to purchase annuities with their pension accounts compared to individuals covered by DB plans.

III. PBGC Administrative Data and Distribution Options

In response to a Freedom of Information Request, the PBGC provided us with relevant information on all individuals who initiated a benefit from the PBGC between 2012 and 2021. The data file was received in November 2022 and included all PBGC Trusted Plan participants who had an actual retirement date in this time period, a total of 250,032 participants. The specific information on PBGC participants included the distribution option selected, individual information on age at retirement, amount of benefit, months of service, and gender. The number of new claimants per year varies between 22,000 and 26,000. Of those retirees, 36% were women and 64% were men. Overall, 20% of the sample was aged 55-59, 37% were 60-64, and 43% were 65 and over. The proportion of new retirees by sex remains relatively stable over the decade while the proportion of new retirees in the oldest age group increases over time (see Table 1).

[Table 1 Here]

Distribution Options Offered by the PBGC

Our main objective is to determine how distribution choices vary by individual characteristics including age at retirement, months of service, sex, and year that the type of benefit was chosen. As with most administrative data sets, data on individual characteristics is severely limited. The data we received from the PBGC includes age when benefits were first received, sex of the claimant, type of distribution, amount of distribution, months of employment covered by the pension plan, and year that benefits were first received.

The PBGC allows retirees to request benefits in a variety of payout methods. There are three basic types of distributions offered by the PBGC: a straight-life annuity which provides the

maximum monthly benefit, several types of J&S annuities, and options for certain-and-continuous annuities. The PBGC website⁸ describes these distribution options in more detail.

- **straight-life annuity.** The straight-life annuity provides a fixed monthly benefit payments for the lifetime of the retiree. No survivor benefit will be paid after the death of the retiree.
- **certain-and-continuous annuity.** This annuity option provides a benefit that will last for the lifetime of the retiree. If the retiree dies before the end of the 5-, 10- or 15-year time period, the designated beneficiary will receive the same monthly benefit for the remainder of the period. If the retiree dies after the end of the period, benefit payments end upon the death of the retiree.
- **joint-and-survivor annuity (J&S).** J&S annuities provide a fixed monthly benefit payments for the lifetime of the retiree with continuing payments to designated beneficiary for the rest of his or her life. The monthly benefit your spouse or other beneficiary receives is 50, 75 or 100 percent of the retiree benefit, depending on the J&S option chose, of the amount paid during the lifetime of the retiree. If the beneficiary dies before the retiree, the monthly benefit for the retiree does not change.⁹

In examining the distribution choices of PBGC retirees, it is important to remember that the sample is composed of only DB participants and that these employees were covered by plans that, for the most part, were offered by firms that were facing challenging economic circumstances. The adverse economic conditions and ultimately the transfer of the management of the pension to the PBGC may have affected employee attitudes and preferences in regard to the type of retirement distribution they preferred.

The base benefit is the straight-life annuity based on the benefit formula from the individual pension plans. The monthly benefit in all other options is reduced in order to produce

⁸ See PBGC (2023b), “Your Benefit, Your Choice” for more details on benefit options.
<https://www.pbgc.gov/sites/default/files/yourbenefityourchoice.pdf>

⁹ Retirees can also select a joint-and-50% survivor "pop-up" annuity that differs from the joint-and-survivor annuity described above in that, if the beneficiary dies before the retiree, the monthly benefit "pops-up" to the straight-life annuity amount for the rest of the life of the retiree. In the data we received, individuals that selected this option are included as a J&S benefit. The data file we received also included a small number of individuals who were reported other types of payouts. We have excluded these from the analysis.

the same present value of the lifetime benefits based on the assumed interest rates when benefits are requested. This calculation depends on the age of the retiree and the age of the spouse or other beneficiary.¹⁰ Appendix A reports the values of the monthly benefit for the various options assuming a retiree age 65 had a straight life annuity of \$500 per month (PBGC, 2023b). If the beneficiary was age 61 and the retiree selected a 50% J&S, the monthly benefit for the life of the retiree would be \$450 and if the beneficiary outlived the retiree, the monthly benefit would be \$225. Of course, a higher J&S, such as 100%, results in a lower benefit during the life of the retiree but a higher benefit if the beneficiary remains alive. These calculations will also differ based on the ages of the retiree and the spouse.

Appendix Table 1 illustrates how the monthly benefit varies with the option chosen and whether there is continuing benefit after the death of the retiree. Consistent with ERISA regulations, married beneficiaries must provide written consent from one's spouse for the participant to select any distribution other than the default benefit specified in the failed plan; this is typically a joint and survivor annuity.

¹⁰ In an email from the PBGC, the calculation process was described and shown to differ by when the retiree requested a distribution. "If a participant retired before the Date of Trusteeship (DOTR) then they chose a form of benefit specific to their plan and the actuarial table(s) and interest specified in their plan were utilized by the prior plan administrator. If a participant retired on/after the Date of Trusteeship (DOTR) then they were placed into pay by the PBGC using the plan's Normal Single-Normal Married form (which would utilize the plan's specific actuarial table(s) and interest for the Normal Married form) or one of the PBGC's Optional Forms of Benefit (which would utilize PBGC's actuarial table(s) and interest). However, within our corporate customer database we do not distinguish whether the form of benefit is a plan Normal Single-Normal Married or a PBGC Optional Form of Benefit. PBGC Optional Benefit Forms are calculated by converting either the plan's normal single form, normal married form, or QPSA form using 1983 GAM mortality (blended 50% male, 50% female) and 6% interest. This is noted in §4022.8(c)(7) of PBGC regulations." Thus, we are not able to determine the actual values used in the calculation of benefits other than the single life annuity and the calculation of benefits will differ across plans."

IV. Benefit Options Chosen by PBGC Claimants

During our sample period, slightly over half of all claimants requested a J&S distribution while 42% chose to receive a straight-life annuity and less than 10% chose a month certain distribution (Table 2). The proportion of new retirees selecting these options remains relatively constant across the ten years in our sample varying by only one or two percentage points from year to year. The most interesting observation from these data is that 58% of men select one of the J&S options while only 38% of women request a J&S benefit.

[Table 2 Here]

The main reason for selecting a J&S annuity is to provide a continuing benefit to one's spouse after the death of the retiree. Unfortunately, the PBGC does not retain information on marital status. However, national data on marital status by age indicates that women in these age ranges are less likely to be married compared to men of similar ages. During our sample period, men aged 55-64 were 6 to 8 percentage points more likely to be married and therefore, a larger percentage of men would be more likely to consider a J&S annuity. An even larger difference in marriage rates in the population was observed for individuals age 65 and over where men were over 20 percentage points more likely to be currently married (Table 3). Thus, differences in marriage rates likely explains much of the difference in the sex differential in the choice of a J&S benefit. In considering these differences in marriage rates, one should remember that the national rates do not necessarily reflect the marriage rates of individuals in the PBGC sample. In addition, the mean age of retirement for the PBGC sample who are over age 65 is much younger than the mean age of the U.S. population over age 65.

[Table 3 Here]

Among the 127,503 retirees selecting a J&S distribution, 48% selected the 50% payout option to the survivor and 45% chose the 100% survivor benefit. Once again, we observe a sizable difference in the distributional preferences by sex as men are more likely to request a 100% payout compared to women. Among men, 49% requested a 100% J&S while 43% chose the 50% J&S. In contrast, among female claimants, only 32% chose the 100% percent options while 62% selected the 50% option (Table 4).

[Table 4 Here]

The third major payout option is a life annuity for the retiree that also provides a certain number of guaranteed monthly payments; i.e. if the retiree dies before the guaranteed number of payments have been received, the beneficiary will continue receiving a monthly check for the duration of the guarantee, the certain-and-continuous annuity described earlier. Overall, less than 10 percent of PBGC retirees selected this option. Among those that did choose the month certain annuity 53.8% chose the 15-year guarantee while 27.8 selected the 10 year and 17.1% the five-year guarantee. Examining the length of guarantee by sex shows that 57.1% of men chose the 15-year guarantee while only 45.5% of the women selected this longer guaranteed payout period (Table 5).

[Table 5 Here]

The PBGC did not provide information on the default straight-life annuity amount for retirees who selected a J&S or a certain-and-continuous annuity. However, we do have the monthly benefit for each retiree given the payout option selected. The real and nominal mean benefits by option are shown by year in Table 6. Interestingly, the monthly benefits for the J&S annuity are greater than those for retirees who requested a Straight Life annuity. This implies that the average straight-life benefit for these retirees would have been higher than the monthly

benefit for those that actually selected the straight-life annuity. Thus, within the PBGC system, retirees with higher default straight-life annuity are more likely to choose a J&S benefit.

[Table 6 Here]

V. Determinants of Choice of Distribution

In this section, we analyze the different factors that can explain the distribution choices of retirees from PBGC administration plans. We focus on the three main categories: straight-life annuity, J&S annuity, and certain-and-continuous annuity. First, we examine the choice among the three basic payout options. We model the choice decision as a multinomial logit and estimate the parameters by maximum likelihood. We consider the following explanatory variables: dummy variables for the year of retirement (2013 to 2021, thus omitting 2012 and setting it as the base year), a dummy variable equal to one if the individual is male and zero otherwise, two dummy variables for age at retirement (less than 60, between 60 and 64, with 65 and older being the base case), and interactions between the male variable and the age dummy variables.

It would be useful to know the final salary of those claiming benefits from the PBGC or the straight-life annuity value for all claimants so that one could better understand whether distribution choices vary by income; however, these data were not available. The PBGC did provide information on the number of months the participant had worked at the time the distribution was requested. In general, longer tenure would be associated with greater benefits. Unfortunately, data on months worked was included for only 63.8% of the retirees. Based on the missing data, we chose not to include months worked in the regression model discussed in the following analysis; however, regressions examining the choice of distribution option that include months worked are shown in Appendix Tables 2-4. Including months work and limiting the sample does not influence the qualitative results presented in this section.

Leaving out all individuals who chose a distribution other than these three main choices, we are left with 248,709 observations. In this sample, 51% of the individuals chose J&S and 42% chose straight-life. In Table 7, we report the marginal effects of the explanatory variables evaluated at the mean of the sample. Standard errors are also reported in the table.

[Table 7 Here]

Estimation results indicate that multiple explanatory variables have economically and statistically significant impacts on the distribution choices. The sex of the individual has a very large impact and the magnitude of this effect differs by age at retirement. For individuals 65 years old and older, being male raises the probability of choosing J&S by about 26.5 percentage points relative to females, while lowering straight-life by about 25.9 percentage points. As shown by the age/sex interaction terms, the sex differences are reduced for individuals who claim benefits at younger ages. For those younger than 60 years old being a male increases the probability of choosing J&S by about 14 percentage points (26.489-12.493) over females while for those between the ages of 60 and 65, males are 18.6 percentage points (26.489-7.902) percentage points more likely to select a J&S annuity.¹¹ Table 8, Panel A more clearly illustrates the age and sex differentials in the annuity choices by showing the predicted probability of selecting a straight life annuity and a J&S annuity by age and sex. As mentioned earlier, the difference in the choice of a J&S annuity probably reflects a lower marriage rate among women

¹¹ Results that include the number of months worked by the retiree are shown in Appendix Table 2. These results indicate that an additional 10 months of employment prior to claiming a benefit increase the probability of selecting a J&S payout by 0.2 percentage points. More months of employment likely is positively correlated with higher earnings and the relationship between months work and higher probability of selecting a J&S annuity may be reflecting this correlation. The marginal effects of the other variables change only slightly with the inclusion of months of work.

along with other factors such as women tend to be married to older men who also are likely to have had higher earnings and may also have earned their own pension benefit.¹²

[Table 8 Here]

There are statistically significant changes in the choice of a distribution over time, primarily between distribution choices before and after 2016. Compared to the first year of the observation period, 2012, the probability that an individual will choose J&S increases beginning in 2016 has a maximum impact of 3.8 percentage points occurring in 2020. Correspondingly, the probability of the other two options tend to decrease over time, with a maximum impact of -2.5 percentage points in 2021 for certain-and-continuous and -2.8 percentage points in 2018 for straight-life annuities.

Retirees selecting a straight-life annuity receive the maximum monthly benefit for the rest of their life; however, this option does not provide any continuing benefit for spouse. Individuals with this annuity have no other choices to make concerning their pension benefit. In contrast, retirees who select a J&S or a months' certain annuity must select the magnitude of the survivor benefit or the length of the guaranteed payments. We now examine each of these options.

Magnitude of J&S Benefit

We now study the determinants of the benefits selected by the individuals who opted for J&S. We focus on the three most common options: 50%, 75% and 100%. These three options

¹² While the sex composition of those claiming benefits remains relatively stable over time, the mean age by sex increases by about two years between 2012 and 2020 before declining by about a year in 2021 (see Appendix Table 5).

cover about 98% of all the individuals who chose J&S, giving us 124,648 observations of individuals who selected a J&S annuity. The 50% and 100% benefit options represent 50% and 46% of the observations, respectively. As in the previous section, we model these three options with a multinomial logit using the same set of explanatory variables (year dummies, male and age dummies, plus their interactions) and estimate by maximum likelihood. The partial effects evaluated at the mean of the sample and their standard errors are reported in Table 9.

[Table 9 Here]

The sex of the individuals has very strong impact on the size of the survivor benefit chosen with men being more likely to select the 100% J&S annuity. One should remember that a higher percent of the retiree benefit that is available to the survivor requires a lower benefit during the life of the retiree. For individuals 65 years old and older, males are much more likely to opt for the 100% benefit option (probability increased by 18.3 percentage points) and less likely to opt for 50% benefit (probability decreased by 19.8 percentage points).

As for the impact of age of the individuals, unsurprisingly younger individuals are more likely to choose the larger survivor benefits. For example, we see that females who are less than 60 years old when retiring are 6.4 percentage points more likely to choose 100% benefit and 5.2 percentage points less likely to choose 50% benefit compared to women over the age of 65 at retirement. The impact of the male variable may reflect the age differences between the spouses with wives typically being younger than their husbands. There are some variations in the

probability of choosing the different benefit levels for some years but no noticeable pattern.¹³

The predicted probabilities of these choices by age and sex are shown in Table 8, Panel B.

Years of Benefits for Certain-and-Continuous Annuity

Individuals opting for the certain-and-continuous option need to decide the length of time of guaranteed payments. Remember in this option, benefits will be paid as long as the retiree survives, however, if the retiree dies before the number of guaranteed payments, the beneficiary will continue to receive the same monthly payment for any additional months. We report in Table 5 the number of individuals who choose the eight most popular options in terms of months of benefits (54 individuals are left out). Table 5, Panel A contains all the observations, while Panels B and C break down the numbers between males and females. The great majority of the observations cluster over 60, 120 and 180 months, with 180 months being the most popular (53% of the observations). Looking at Panels B and C, we see a meaningful difference between males and females, the latter choosing less frequently the longest option (180 months) and opting relatively more frequently for shorter options like 60 and 120 months.

We next model the selection of the length of time chosen by the individuals who opted for the certain-and-continuous option. For this, we focus on the three most popular options (60, 120, 180 months), which represent the bulk of the observations. This gives us 16,395 observations, with 17%, 28% and 54% choosing, respectively, 5, 10 and 15 years. We again use a multinomial logit model. We use the same set of explanatory variables as described earlier (year dummies, male and age dummies, plus their interactions) and estimate the choice of the

¹³ Once again, including the variable months worked in the regression does not alter the impact of the other variables on the choice of the size of the survivor's benefits.

length of the guaranty by maximum likelihood. The resulting partial effects evaluated at the mean of the sample and their standard errors are reported in Table 10.

[Table 10 Here]

Once again, the estimates indicate that the sex of the individual has a large and significant impact on the choices of retirees. Males 65 or older have a 14.3 percentage points higher probability of choosing the longest option (15 years) compared to females, while 8 percentage points and 6.3 percentage points lower probability of choosing the 5 and 10-years options respectively. Unsurprisingly, age at retirement has an economically very strong impact. For females, holding everything else constant, being less than 60 years old increases the probability of choosing the 15 years option by 24.9 percentage points, while reducing the shorter options by 14.2 percentage points (10 years) and 10.7 percentage points (5 years). The impact for females between 60 and 65 years old is less but still significant: 15 years up by 9.9 percentage points, 10 years down by 5.6 percentage points, 5 years down by 4.2 percentage points. Being male instead of female mitigates the impact of age at retirement. For example, for individuals younger than 60 years old, the probability that a male chooses the 15 years benefit is 9 percentage points lower compared to a female. The predicted probability of the length of the guarantee by age and sex are shown in Table 8, Panel C.

Across time, we see a significant change in the second half of our period, with probabilities of choosing the 15 years option decreasing between 4.9 and 8.2 percentage points, with the biggest increase in probabilities going to the shortest option (5 years).

VI. Estimated Value of Monthly Benefits

Earlier, we described the payout options available to individuals covered by PBGC-managed plans. In these plans, the benefit is first shown as a straight-life annuity which is determined by the benefit formula of each plan. The PBGC also offers a J&S option and a months-certain annuity. Individuals who select one of these distributions receive a lower monthly benefit in exchange for a survivor's benefit. An interesting observation shown in Table 6 is that the mean J&S benefit was about 10% higher than the straight life annuity for retirees in our sample. This finding suggests that individuals with higher potential straight life annuities are more likely to select a J&S annuity.

It would be useful to better understand how monthly benefits paid by the PBGC vary by individual characteristics and distributional choices. Using the limited data provided by the PBGC, we estimate the log of real monthly benefits as a function of the age and sex of the retiree. In this model, we use the actual age that benefits were first received along with an indicator variable for being male, with being female as the omitted category. Receiving a straight-life annuity is the base case in this model as the regression includes dummy variables indicating that the retiree selected either a J&S annuity or a months-certain benefit. The sample includes individuals who selected one of these three types of benefits. In addition, we include a series of year variables indicating the year the benefit was first received with 2021 being the base year. The monthly benefits are in real 2021 dollars.

The model is estimated using two samples: the sample we used earlier that includes all individuals who claimed benefits between 2012 and 2021 and a sample that includes only those individuals for whom the PBGC reported their months of services with their employer. As discussed earlier, only about 60% of the respondents had a value for months of service. Including this variable reduces the sample to 150,836 individuals. In general, months of service should be

positively correlated with the retirement benefit since most DB benefit formulas include length of service in the benefit calculation formula. In the regression, this variable is included in log terms. Thus, the coefficient on months of service provides an estimate of the elasticity between months of service and the monthly benefit. The regression results are shown in Table 11, Column 1 shows the estimated coefficients from the model that includes months of service while Column 2 reports the estimates for the complete sample without months of service. The qualitative results are similar for the two models.

[Table 11 Here]

Focusing on the results in Column 1, we see an interesting series of results. First, men have an 18% higher monthly benefit from the PBGC-managed plans. Second, each additional year of age increases the monthly benefit by 3.8%. Third, a 10% increase in months of service yields an 8.2% increase in the monthly benefit. At the mean values, this implies that 18 additional months of service results in a \$48 per month higher benefit. These findings are consistent with our expectations. Introducing these control variables into the analysis helps explain the observations on monthly benefit by type of payout options shown in Table 6. Holding age, sex, and length of service constant, the J&S annuity is now shown to be 2.7% smaller than the straight-life annuity. Interestingly, the model in Column 2 without months of service, the J&S coefficient is positive.

VI. Conclusions

We use administrative data provided by the PBGC to examine the choice of pension payouts to retirees in plans managed by the PBGC. The key finding from this analysis is that distributions choices vary by individual characteristics, specifically sex and age. Men are more

likely to select an annuity that provides for a survivor benefit for their spouses compared to women. The difference between the annuity choices of men and women increases with age.

Conditional on requesting a J&S distribution, men are more likely to select a benefit that provides a larger benefit to the beneficiary by selecting the 100% J&S option while women are more likely to select a beneficiary annuity of only 50%. Among retirees that select the certain-and-continuous option, men are more likely to request the longer number of guaranteed months of payments. Comparatively, women making this distribution selection at retirement are more likely to select the straight life annuity option with no survivor benefit, particularly those women over the age of 65.

As with most studies using administrative data, we do not have access to individual characteristics that would help explain the differences in distribution choices by sex. The most important missing characteristics from the analysis are marital status and the potential straight-life annuity for all retirees. Marital status is an important factor in whether the retiree would select a J&S annuity. In addition, information on the spouse of the retiree should help explain the choice of a J&S distribution including the age of the spouse and whether the spouse has or expects to receive a pension based on their own work history. Another important factor determining the choice of pension distributions is the size of the potential straight-life annuity as individuals with higher pension benefits seem to be more likely to select J&S annuities to provide life time income protection for their spouses. Despite these limitations, the results provide a first assessment of distribution choices by retirees covered by PBGC managed pension plans.

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Table 1. PBGC Sample Composition Means

			Age			
	Nb. Obs.	Male (%)	Less than 55	55-59	60-64	65 and over
All years	250032	0.64	0.01	0.20	0.37	0.43
2012	25587	0.62	0.02	0.25	0.39	0.34
2013	24465	0.64	0.01	0.24	0.39	0.35
2014	24853	0.64	0.01	0.23	0.42	0.35
2015	24914	0.64	0.01	0.21	0.41	0.37
2016	24638	0.64	0.01	0.20	0.39	0.40
2017	22958	0.64	0.01	0.19	0.37	0.43
2018	22658	0.63	0.00	0.18	0.34	0.48
2019	22490	0.63	0.00	0.15	0.31	0.53
2020	22122	0.64	0.00	0.14	0.31	0.55
2021	26078	0.65	0.00	0.22	0.35	0.43

Source: Administrative records from the PBGC and our calculations.

Table 2. Distribution Options Selected from PBGC by Sex and Year**Panel A. Distribution Option Selected (percent of total)**

Period	Nb. Obs.	Months certain	J&S	Straight life	Others
All years	250032	0.07	0.51	0.42	0.01
2012	25587	0.08	0.49	0.43	0.00
2013	24465	0.08	0.50	0.42	0.00
2014	24853	0.08	0.50	0.42	0.00
2015	24914	0.07	0.50	0.43	0.01
2016	24638	0.07	0.51	0.41	0.01
2017	22958	0.07	0.52	0.41	0.01
2018	22658	0.06	0.53	0.40	0.01
2019	22490	0.06	0.52	0.41	0.01
2020	22122	0.06	0.53	0.41	0.01
2021	26078	0.05	0.52	0.42	0.00

Panel B. Distribution Option Selected (percent of total) for Males

Period	Nb. Obs.	Months certain	J&S	Straight life	Others
All years	158999	0.07	0.58	0.34	0.00
2012	15978	0.08	0.57	0.35	0.00
2013	15777	0.08	0.58	0.34	0.01
2014	15916	0.07	0.57	0.35	0.00
2015	15893	0.07	0.57	0.36	0.00
2016	15764	0.07	0.59	0.34	0.01
2017	14707	0.07	0.59	0.34	0.01
2018	14246	0.06	0.60	0.33	0.00
2019	14069	0.06	0.59	0.34	0.01
2020	14053	0.06	0.60	0.33	0.00
2021	16825	0.05	0.60	0.35	0.00

Panel C. Distribution Option Selected (percent of total) for Females

Period	Nb. Obs.	Months certain	J&S	Straight life	Others
All years	91033	0.07	0.38	0.55	0.01
2012	9609	0.07	0.36	0.56	0.01
2013	8688	0.08	0.36	0.56	0.00
2014	8937	0.08	0.36	0.55	0.01
2015	9021	0.07	0.37	0.55	0.01
2016	8874	0.07	0.38	0.54	0.01
2017	8251	0.07	0.39	0.54	0.01
2018	8412	0.07	0.40	0.52	0.01
2019	8421	0.06	0.39	0.54	0.01
2020	8069	0.06	0.40	0.53	0.01
2021	9253	0.05	0.39	0.55	0.00

Source: Administrative records from the PBGC and our calculations.

Table 3. Percent Married by Sex and Age: U.S. Population

Year	Men			Women		
	45-54	55-64	65 and up	45-54	55-64	65 and up
2012	63.5%	68.3%	70.7%	61.6%	60.5%	42.4%
2013	63.5%	67.8%	70.5%	61.6%	60.5%	42.9%
2014	63.3%	67.4%	70.3%	61.5%	60.5%	43.2%
2015	63.3%	66.4%	70.0%	61.5%	60.0%	43.5%
2016	63.4%	66.0%	69.5%	61.6%	60.1%	43.9%
2017	63.8%	66.0%	69.7%	61.9%	60.3%	44.7%
2018	64.1%	65.7%	69.3%	62.3%	60.0%	45.0%
2019	64.1%	65.3%	68.6%	62.4%	60.2%	45.1%
2020*	64.8%	66.2%	69.1%	62.7%	60.5%	44.7%
2021	65.3%	65.9%	68.7%	62.9%	60.2%	46.2%

*The Census Bureau did not release its standard 2020 ACS 1-year estimates because of the impacts of the COVID-19 pandemic. The 5 year estimated data is used for our table for 2020. All other data is from ACS 1 year estimates subject tables. Retrieved March 4, 2023.

Source American Community Survey

Table 4. Size of J&S Survivor Benefit Selected by Sex

Panel A. J&S Size of Survivor Benefit

J&S option	50%	51%-74%	75%	100%	Other
Nb. Obs.	61736	2844	5911	57001	11
Fraction of obs.	0.48	0.02	0.05	0.45	0.00

Panel B. J&S Size of Survivor Benefit: Males

J&S option	50%	51%-74%	75%	100%	Other
Nb. Obs.	40185	2179	4695	45889	6
Fraction of obs.	0.43	0.02	0.05	0.49	0.00

Panel C. J&S Size of Survivor Benefit: Females

J&S option	50%	51%-74%	75%	100%	Other
Nb. Obs.	21551	665	1216	11112	5
Fraction of obs.	0.62	0.02	0.04	0.32	0.00

Source: Administrative records from the PBGC and our calculations.

Table 5. Number of Guaranteed Months of Benefit Payments

Panel A. Certain-and-Continuous Annuity Length of Guaranteed Payments (the eight most popular options)

Nb. Of months	12	24	36	60	72	100	120	180
Nb. Obs	82	12	65	2866	212	16	4669	8860
Fraction of obs.	0.00	0.00	0.00	0.17	0.01	0.00	0.28	0.53

Panel B. Certain-and-Continuous Annuity Length of Guaranteed Payments (the eight most popular options): Males

Nb. Of months	12	24	36	60	72	100	120	180
Nb. Obs	54	10	34	1548	134	6	2735	6023
Fraction of obs.	0.01	0.00	0.00	0.15	0.01	0.00	0.26	0.57

Panel C. Certain-and-Continuous Annuity Length of Guaranteed Payments (the eight most popular options): Females

Nb. Of months	12	24	36	60	72	100	120	180
Nb. Obs	28	2	31	1318	78	10	1934	2837
Fraction of obs.	0.00	0.00	0.00	0.21	0.01	0.00	0.31	0.45

Source: Administrative records from the PBGC and our calculations.

Table 6. Average Monthly Benefit by Payout Option

Panel A. Average Monthly Nominal Benefits by Payout Option

Period	Months Certain	J&S	Straight Life	Others
All years	435.24	558.52	510.87	480.56
2012	363.25	484.68	470.22	444.52
2013	384.00	489.72	442.12	449.93
2014	393.48	480.39	444.94	445.50
2015	392.24	507.04	464.15	470.04
2016	405.60	521.54	467.11	430.38
2017	439.39	532.21	484.22	504.93
2018	447.05	569.89	510.70	477.76
2019	480.21	580.56	537.04	449.23
2020	510.39	638.52	595.10	449.80
2021	581.81	702.75	654.79	638.03

Panel B. Average Monthly Real Benefits by Payout Option

Period	Months Certain	J&S	Straight Life	Others
All years	476.54	605.59	556.74	519.67
2012	428.63	571.92	554.86	524.53
2013	445.44	568.07	512.86	521.92
2014	448.57	547.65	507.24	507.87
2015	447.15	578.02	529.13	535.85
2016	458.33	589.34	527.84	486.32
2017	487.72	590.75	537.48	560.47
2018	482.82	615.48	551.55	515.98
2019	509.02	615.40	569.26	476.18
2020	535.91	670.45	624.86	472.28
2021	581.81	702.75	654.79	638.03

Monthly benefit values have been adjusted for inflation (real dollars in 2021).

Source: Administrative records from the PBGC and our calculations.

Table 7. Distribution Choices of Retirees from PBGC Administered Plans: Marginal Effects

	Months Certain	J&S	Straight Life
Year 2013	0.262 (0.201)	0.240 (0.428)	-0.502 (0.422)
Year 2014	0.042 (0.202)	0.194 (0.426)	-0.236 (0.419)
Year 2015	-0.136 (0.204)	0.100 (0.425)	0.036 (0.418)
Year 2016	-0.575*** (0.208)	1.846*** (0.427)	-1.271*** (0.421)
Year 2017	-0.813*** (0.215)	2.226*** (0.436)	-1.413*** (0.430)
Year 2018	-0.901*** (0.217)	3.721*** (0.438)	-2.820*** (0.432)
Year 2019	-1.450*** (0.223)	3.018*** (0.439)	-1.568** (0.433)
Year 2020	-1.489*** (0.225)	3.845*** (0.442)	-2.355*** (0.436)
Year 2021	-2.527*** (0.222)	2.993*** (0.420)	-0.466 (0.413)
Male	-0.633*** (0.165)	26.489*** (0.330)	-25.856*** (0.319)
Age<60	0.103 (0.215)	10.743*** (0.440)	-10.846*** (0.422)
60<=Age<65	0.022 (0.195)	4.046*** (0.398)	-4.068*** (0.378)
(Male)*(Age<60)	-0.009 (0.279)	-12.493*** (0.561)	12.503*** (0.549)
(Male)*(60<=Age<65)	0.538*** (0.242)	-7.902*** (0.490)	7.364*** (0.474)
Fraction of sample	0.07	0.51	0.42

Number of observations is 248,709. The numbers in parentheses are standard errors. The Year variables are dummy variables equal to one for the given year, equal to zero otherwise (the year left out is 2012). The variable Male is a dummy variable equal to one if the individual is identified as male, zero otherwise. The two Age variables are dummy variables equal to 1 if the individual is less than 60 years old (Age<60), zero otherwise; equal to 1 if the individual is between the age of 60 and 65 years old (60<=Age<65), zero otherwise. The last two regressors are interaction terms. The degree of statistical significance is shown by 10% (*), 5% (**) and 1% (***).

Table 8. Predicted Probability of Distribution Choices by Age and Sex

Panel A. Predicted Probability of Selecting J&S and Straight Life

Age	J&S		Straight Life	
	Men	Women	Men	Women
Less than 60	58.88%	45.00%	34.62%	47.83%
60-65	56.81%	38.41%	36.19%	54.70%
Older than 65	60.55%	34.58%	33.07%	58.73%

Panel B. Predicted Probability of Selecting Size of Survivor Benefit

Age	50%		100%	
	Men	Women	Men	Women
Less than 60	42.23%	60.56%	54.24%	36.28%
60-65	43.21%	63.84%	51.38%	32.66%
Older than 65	46.14%	65.40%	48.17%	30.68%

Panel C: Predicted probability of Selecting Length of Annuity Guarantee

Age	5 years		10 years		15 years	
	Men	Women	Men	Women	Men	Women
Less than 60	12.82%	14.52%	20.17%	23.39%	67.01%	62.08%
60-65	13.82%	21.16%	25.21%	31.64%	60.97%	47.20%
Older than 65	17.16%	25.80%	31.17%	36.73%	51.68%	37.47%

Table 9. Size of Survivor Payments: Marginal Effects

	50%	75%	100%
Year 2013	-2.385***	0.683***	1.703*
	(0.610)	(0.248)	(0.605)
Year 2014	0.080	0.353	-0.433
	(0.605)	(0.251)	(0.602)
Year 2015	-0.946	0.351	0.596
	(0.607)	(0.251)	(0.603)
Year 2016	-0.182	0.473*	-0.291
	(0.604)	(0.248)	(0.600)
Year 2017	2.184***	-0.578**	-1.605***
	(0.613)	(0.268)	(0.611)
Year 2018	0.147	0.281	-0.428
	(0.613)	(0.254)	(0.609)
Year 2019	0.454	-0.246	-0.208
	(0.617)	(0.263)	(0.614)
Year 2020	0.111	0.280	-0.391
	(0.618)	(0.255)	(0.615)
Year 2021	-0.839	-0.241	1.080*
	(0.591)	(0.252)	(0.587)
Male	-19.816***	1.505***	18.311***
	(0.515)	(0.219)	(0.524)
Age<60	-5.222***	-1.145***	6.367***
	(0.705)	(0.334)	(0.717)
60<=Age<65	-1.762***	-0.582*	2.344***
	(0.667)	(0.304)	(0.682)
(Male)*(Age<60)	1.428*	-1.028**	-0.400
	(0.839)	(0.392)	(0.845)
(Male)*(60<=Age<65)	-1.227	0.376	0.850
	(0.764)	(0.337)	(0.775)
Fraction of sample	0.50	0.05	0.46

Number of observations is 124,648. The numbers between parentheses are standard errors. The Year variables are dummy variables equal to one for the given year, equal to zero otherwise (the year left out is 2012). The variable Male is a dummy variable equal to one if the individual is identified as male, zero otherwise. The two Age variables are dummy variables equal to one if the individual is less than 60 years old (Age<60), zero otherwise; equal to one if the individual is between the age of 60 and 65 years old (60<=Age<65), zero otherwise. The degree of statistical significance is shown by 10% (*), 5% (**) and 1% (***).

Table 10. Length of Certain-and-Continuous Payouts: Marginal Effects

	5 Years	10 Years	15 Years
Year 2013	4.251***	-3.604**	-0.647
	(1.201)	(1.432)	(1.566)
Year 2014	2.830**	-1.941	-0.889
	(1.230)	(1.423)	(1.581)
Year 2015	2.228*	-0.292	-1.936
	(1.235)	(1.415)	(1.581)
Year 2016	2.092*	-0.437	-1.655
	(1.264)	(1.446)	(1.621)
Year 2017	3.484***	1.403	-4.887***
	(1.284)	(1.470)	(1.661)
Year 2018	4.228***	1.780	-6.008***
	(1.269)	(1.488)	(1.681)
Year 2019	6.572***	1.659	-8.230***
	(1.264)	(1.535)	(1.734)
Year 2020	7.656***	0.445	-8.101***
	(1.258)	(1.562)	(1.750)
Year 2021	4.235***	-0.704	-3.532**
	(1.306)	(1.554)	(1.737)
Male	-8.001***	-6.325***	14.326***
	(0.873)	(1.096)	(1.280)
Age<60	-10.678***	-14.203***	24.881***
	(1.241)	(1.526)	(1.685)
60<=Age<65	-4.242***	-5.649***	9.891***
	(1.014)	(1.302)	(1.504)
(Male)*(Age<60)	6.244***	2.727	-8.971***
	(1.681)	(2.029)	(2.198)
(Male)*(60<=Age<65)	0.662	-0.180	-0.483
	(1.333)	(1.641)	(1.865)
Fraction of sample	0.17	0.28	0.54

Number of observations is 16,395. The numbers between parentheses are standard errors. The Year variables are dummy variables equal to one for the given year, equal to zero otherwise (the year left out is 2012). The variable Male is a dummy variable equal to one if the individual is identified as male, zero otherwise. The two Age variables are dummy variables equal to one if the individual is less than 60 years old (Age<60), zero otherwise; equal to one if the individual is between the age of 60 and 65 years old (60<=Age<65), zero otherwise. The degree of statistical significance is shown by 10% (*), 5% (**) and 1% (***).

Table 11. Estimates of Value of Monthly Benefit (log of monthly benefit)

Regressors	Model with months of service	Model without months of service
Months Certain	-0.1398*** (0.0081)	-0.1326*** (0.0077)
J&S	-0.0266*** (0.0044)	0.0147*** (0.0042)
Age	0.0376*** (0.0006)	0.0254*** (0.0005)
Male	0.1807*** (0.0044)	0.2331*** (0.0041)
Log(months of service)	0.8200*** (0.0042)	
Year 2012	-0.3036*** (0.0088)	-0.2243*** (0.0086)
Year 2013	-0.3239*** (0.0089)	-0.2501*** (0.0086)
Year 2014	-0.3212*** (0.0088)	-0.2519*** (0.0085)
Year 2015	-0.2727*** (0.0089)	-0.2195*** (0.0085)
Year 2016	-0.2649*** (0.0088)	-0.2248*** (0.0085)
Year 2017	-0.2630*** (0.0090)	-0.2236*** (0.0087)
Year 2018	-0.2520*** (0.0092)	-0.2100*** (0.0088)
Year 2019	-0.2518*** (0.0092)	-0.2140*** (0.0088)
Year 2020	-0.1607*** (0.0093)	-0.1503*** (0.0089)
R ²	0.2879	0.0321
N	150,836	239,484

The numbers between parentheses are standard errors. The variables Months Certain and J&S are dummy variables equal to one if the individual selected a months-certain benefits, zero otherwise; equal to one if the individual selected a J&S annuity, zero otherwise. The variable Male is a dummy variable equal to one if the individual is identified as male, zero otherwise. The Year variables are dummy variables equal to one for the given year, equal to zero otherwise (the year left out is 2021). The degree of statistical significance is shown by 10% (*), 5% (**) and 1% (***).

Appendix Table 1. Example of Monthly Benefits by Payout Options

The following chart illustrates the benefit distribution options available to an annuitant. These examples assume that the annuitant (participant) will be age 65 and survivor will be age 61 when benefit payments start and are sourced from the Your Benefit, Your Choice • Benefit Options from PBGC guide.

Benefit Form	Annuitant Benefit	Survivor Benefit
Straight Life Annuity	\$500	None
Joint-and-50% Survivor Annuity	\$450	\$225
Joint-and-75% Survivor Annuity	\$429	\$322
Joint-and-100% Survivor Annuity	\$409	\$409
Joint-and-50% Survivor “Pop-up” Annuity	\$444	\$222
5-year Certain-and- Continuous Annuity	\$494	\$494
10-year Certain-and- Continuous Annuity	\$477	\$477
15-year Certain-and- Continuous Annuity	\$452	\$452

Source: PBGC 2023b. <https://www.pbgc.gov/sites/default/files/yourbenefityourchoice.pdf>
Accessed February 2023.

**Appendix Table 2. Distribution Choices of Retirees from PBGC Administered Plans:
Marginal Effects (with months of service)**

	Months Certain	J&S	Straight Life
Months of service	-0.005*** (0.001)	0.022*** (0.001)	-0.016*** (0.001)
Year 2013	0.104 (0.254)	0.756 (0.531)	-0.859* (0.522)
Year 2014	-0.098 (0.255)	0.906 (0.528)	-0.808 (0.519)
Year 2015	-0.122 (0.255)	0.570 (0.526)	-0.448 (0.517)
Year 2016	-0.741*** (0.262)	2.489*** (0.530)	-1.748*** (0.521)
Year 2017	-0.648** (0.268)	2.011*** (0.543)	-1.364** (0.534)
Year 2018	-0.817*** (0.274)	3.779*** (0.548)	-2.963*** (0.540)
Year 2019	-1.557*** (0.287)	2.946*** (0.555)	-1.389** (0.546)
Year 2020	-1.597*** (0.292)	4.158*** (0.564)	-2.562*** (0.556)
Year 2021	-2.714*** (0.291)	4.183*** (0.541)	-1.470*** (0.532)
Male	-0.700*** (0.214)	25.896*** (0.421)	-25.196*** (0.406)
Age<60	1.188*** (0.285)	9.496*** (0.597)	-10.685*** (0.572)
60<=Age<65	0.399 (0.256)	2.371*** (0.516)	-2.769*** (0.487)
(Male)*(Age<60)	-0.382 (0.361)	-11.653*** (0.738)	12.035*** (0.721)
(Male)*(60<=Age<65)	0.470 (0.311)	-7.539*** (0.620)	7.068*** (0.597)
Fraction of sample	0.07	0.51	0.42

Number of observations is 158,755. The numbers between parentheses are standard errors. The Year variables are dummy variables equal to one for the given year, equal to zero otherwise (the year left out is 2012). The variable Male is a dummy variable equal to one if the individual is identified as male, zero otherwise. The two Age variables are dummy variables equal to one if the individual is less than 60 years old (Age<60), zero otherwise; equal to one if the individual is between the age of 60 and 65 years old (60<=Age<65), zero otherwise. The last two regressors are interaction terms. The degree of statistical significance is shown by 10% (*), 5% (**) and 1% (***).

Appendix Table A3. Size of Survivor Payments: Marginal Effects (with months of service)

	50%	75%	100%
Months of service	-0.013*** (0.002)	0.011*** (0.001)	0.002 (0.002)
Year 2013	-2.829*** (0.752)	0.510* (0.308)	2.319*** (0.749)
Year 2014	-0.319 (0.746)	0.266 (0.311)	0.052 (0.744)
Year 2015	-2.226*** (0.750)	0.432 (0.309)	1.794** (0.747)
Year 2016	-0.911 (0.746)	0.639** (0.306)	0.272 (0.744)
Year 2017	1.157 (0.763)	-0.462 (0.334)	-0.695 (0.763)
Year 2018	-1.004 (0.767)	0.572* (0.316)	0.432 (0.765)
Year 2019	0.773 (0.782)	-0.122 (0.335)	-0.651 (0.781)
Year 2020	-0.974 (0.787)	0.163 (0.330)	0.810 (0.785)
Year 2021	-2.751*** (0.756)	0.290 (0.317)	2.461*** (0.751)
Male	-19.400*** (0.659)	1.234*** (0.282)	18.166*** (0.673)
Age<60	-8.058*** (0.949)	-1.429*** (0.451)	9.488*** (0.968)
60<=Age<65	-1.857** (0.862)	-0.930** (0.394)	2.787*** (0.886)
(Male)*(Age<60)	2.714** (1.107)	-0.686 (0.518)	-2.028* (1.119)
(Male)*(60<=Age<65)	-1.398 (0.974)	0.339 (0.433)	1.058 (0.994)
Fraction of sample	0.48	0.05	0.47

Number of observations is 79,949. The numbers between parentheses are standard errors. The Year variables are dummy variables equal to one for the given year, equal to zero otherwise (the year left out is 2012). The variable Male is a dummy variable equal to one if the individual is identified as male, zero otherwise. The two Age variables are dummy variables equal to one if the individual is less than 60 years old (Age<60), zero otherwise; equal to one if the individual is between the age of 60 and 65 years old (60<=Age<65), zero otherwise. The degree of statistical significance is shown by 10% (*), 5% (**) and 1% (***).

Appendix Table 4. Length of Certain-and-Continuous Payouts: Marginal Effects (with months of service)

	5 Years	10 Years	15 Years
Months of service	-0.009**	0.011**	-0.002
	(0.004)	(0.005)	(0.006)
Year 2013	3.358**	-1.917	-1.441
	(1.473)	(1.765)	(1.929)
Year 2014	1.580	-0.171	-1.410
	(1.513)	(1.750)	(1.948)
Year 2015	2.896**	-0.103	-2.793
	(1.476)	(1.751)	(1.933)
Year 2016	1.091	1.276	-2.366
	(1.550)	(1.782)	(1.998)
Year 2017	1.794	3.583**	-5.376***
	(1.577)	(1.791)	(2.028)
Year 2018	4.132***	2.319	-6.450***
	(1.540)	(1.851)	(2.072)
Year 2019	5.599***	4.226**	-9.825***
	(1.585)	(1.924)	(2.187)
Year 2020	8.488***	2.353	-10.841***
	(1.559)	(1.986)	(2.228)
Year 2021	4.186**	-0.161	-4.025*
	(1.650)	(2.032)	(2.247)
Male	-8.354***	-7.859***	16.213***
	(1.109)	(1.391)	(1.637)
Age<60	-9.059***	-15.302***	24.361***
	(1.562)	(1.963)	(2.174)
60<=Age<65	-2.351*	-7.662***	10.013***
	(1.272)	(1.675)	(1.941)
(Male)*(Age<60)	6.018***	4.288*	-10.306***
	(2.070)	(2.541)	(2.767)
(Male)*(60<=Age<65)	-0.362	1.605	-1.243
	(1.645)	(2.062)	(2.353)
Fraction of sample	0.17	0.28	0.55

Number of observations is 10,695. The numbers between parentheses are standard errors. The Year variables are dummy variables equal to one for the given year, equal to zero otherwise (the year left out is 2012). The variable Male is a dummy variable equal to one if the individual is identified as male, zero otherwise. The two Age variables are dummy variables equal to one if the individual is less than 60 years old (Age<60), zero otherwise; equal to one if the individual is between the age of 60 and 65 years old (60<=Age<65), zero otherwise. The degree of statistical significance is shown by 10% (*), 5% (**) and 1% (***).

Appendix Table 5. Mean Age of Sample

Year	Total	Males	Females
All	62.27	62.23	62.33
2012	61.41	61.42	61.40
2013	61.55	61.53	61.57
2014	61.66	61.65	61.67
2015	61.89	61.88	61.92
2016	62.17	62.16	62.18
2017	62.38	62.34	62.45
2018	62.76	62.76	62.77
2019	63.18	63.15	63.24
2020	63.44	63.38	63.55
2021	62.52	62.36	62.81

Source: Source: Administrative records from the PBGC and our calculations.