MILLIMAN REPORT

Duty Disability Insurance Program Experience Studies

Prepared for the State of Wisconsin Department of Employee Trust Funds

May 2023

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June 6, 2023

Mr. Jim Guidry
Director
Benefit Services Bureau
Wisconsin Department of Employee Trust Funds
Madison, WI 53707

RE: Experience Studies for the Duty Disability Insurance Program

Dear Jim,

Thank you for asking Milliman to perform experience studies for the Duty Disability Insurance program. The studies are based on Duty Disability experience from 2016 through 2022. We used the results of these studies to develop new assumptions for performing the actuarial valuation of the Duty Disability program as of December 31st, 2022.

We have analyzed Duty Disability offset approval rates and amounts, claim termination rates, dependent benefits and overpayment recoveries which are the key components of our valuation basis. This report provides the results from our analysis, along with detailed documentation of the study methods and data in the following sections:

- Executive Summary
- Offset Study
- Claim Termination Rate Study
- Death Benefit Study
- Overpayment Study
- Runout Study

Please review this information and let us know if you have any questions. We look forward to discussing this information with you in the near future.

Sincerely,

Maxwell Berube, FSA, MAAA
Actuary

Paul Correia, FSA, MAAA
Principal and Consulting Actuary

cc: Gina Fischer, Erin Esser, Matt Nelson, Megan Jeffers (ETF)
Dan Skwire (Milliman)

Executive Summary

- We performed experience studies using Duty Disability data from 2016 through 2022[1]. Based on the results of these studies, we developed new assumptions which we propose using for performing the December 31st, 2022 valuation of the Duty Disability program.

- We developed a new claim termination basis for projecting future benefit payments. These claim termination rates were developed based on the most recent WRS Three-Year Experience Study prepared by Gabriel, Roeder, Smith & Company (GRS), along with our claim termination rate and runout studies.

- We developed new estimated offset assumptions for Social Security, Retirement, Disability, Separation and Other Earnings benefits. The structure of the new assumptions is different than the current basis and varies by claim duration. We believe this new approach is an enhancement to the liability calculation as it reflects changes over time in the probability of being approved for benefits from other sources. The “Offset Study” section of this report contains the new estimated offset assumptions along with details of the underlying analysis.

- We performed an overpayment recovery study to estimate the proportion of overpayment balances that will eventually be recovered by The Wisconsin Department of Employee Trust Funds (ETF). Based on the results of this study we believe that the valuation should reflect that outstanding overpayment balances will be largely recovered.

- We developed assumptions regarding the probability of receiving death benefits for dependents based on Duty Disability experience and U.S. census data. Based on our analysis, we have reduced the likelihood of spouses receiving benefits from 33% to 25% and have added a liability for future child benefits.

- Our testing indicates that the new basis produces liabilities similar to the current basis for open claims as of December 31, 2021 in aggregate. The following table compares the Duty Disability open claim liabilities as of December 31st, 2021 on the current basis and the proposed new basis:

Table 1:
Open Claim Liabilities as of December 31st, 2021

Liability Component	Duty Disability	
	Current	New
Open Claim Reserves (Employees)	$435,774,770	$424,878,607
Open Claim Reserves (Dependents)	$24,013,847	$28,068,374
Future Death Benefits (Spouses)	$26,056,203	$30,897,797
Future Death Benefits (Children)	N/A	$1,294,959
Credit for Overpayment Recovery	N/A	$(208,016)
Total	**$485,844,820**	**$484,931,721**

[1] Study periods varied based on the assumptions being analyzed and are covered in the detailed sections below.

Offset Study

We performed an offset study based on open Duty Disability claims as of each year end from December 31st, 2016 through December 31st, 2021. From these listings we analyzed the following offsets:

- 40.63 Disability Offsets
- Retirement Offsets
- Social Security Offsets (including both Disability and Retirement)
- Separation Offsets
- Worker's Compensation & Earnings Offsets

Due to key differences between the offsets, we took a tailored approach to analyzing each one. We assumed that Retirement, Separation and 40.63 benefits were mutually exclusive.

40.63 Disability Offsets

40.63 Disability Benefits are disability benefits for participants who become permanently disabled, and are provided through the Wisconsin Retirement System. Prior to January 1st, 2018, participants could be eligible for either 40.63 benefits or LTDI benefits depending on their date of hire. However, the LTDI program has since closed to new claims.

We analyzed the number of individuals who had 40.63 offsets but did not have retirement or separation offsets. The pattern we observed did not show strong evidence of an increasing trend by duration, therefore we have not estimated an offset for disability benefits at this time. We are assuming that 40.63 benefits are awarded relatively quickly and are unlikely to be awarded in later claim durations. Although we notice a spike in the proportion corresponding to duration 11+ years in Table 2, it seems unlikely that 40.63 benefits would only be awarded after 10 years of disability. LTDI claims are not included in Table 2, however we do not believe it would change our conclusions regarding the lag in receiving benefits.

Table 2:
Proportion Approved for 40.63 by Claim Duration

Duration (Years)	Number with Offset	Number Eligible	Proportion
1	0	6	0%
2	2	19	11%
3	4	37	11%
4	6	49	12%
5	6	51	12%
6	7	57	12%
7	6	49	12%
8	7	44	16%
9	7	38	18%
10	9	37	24%
11+	105	142	74%
Total	121	211	57%

Retirement Benefits

We estimated retirement benefits for those who attained age 50 or greater but did not yet have separation or 40.63 benefits. Based on the open claim listings from December 31st, 2016 through December 31st, 2021, 97% of members over age 50 without separation or 40.63 benefits had a retirement offset. Therefore, we assumed that 97% of members younger than age 50 would receive this offset at age 50 if they did not already receive a separation offset by then.

Social Security Offsets

We developed two sets of assumptions for Social Security offsets based on the claimants' attained ages. At age 62, the Duty Disability program requires that claimants apply for Social Security Retirement benefits if the claimant's disability is not severe enough to qualify for Social Security Disability Income benefits (else the Duty Disability benefit is reduced by an estimated offset). Based on the historical claims listings, 96% of individuals over age 62 had a Social Security offset, and therefore we assumed that anyone who had not yet reached age 62 would have a 96% probability of receiving a Social Security offset once they reach age 62.

Prior to age 62 we analyzed the proportion of individuals with Social Security offsets at each duration.

Table 3:
Proportion Approved for Social Security Offsets
Under Attained Age 62

Duration (Years)	Number with Offset	Number Eligible	Proportion
1	0	8	0%
2	1	39	3%
3	2	84	2%
4	9	104	9%
5	16	110	15%
6	19	112	17%
7	20	113	18%
8	20	117	17%
9	20	110	18%
10	23	112	21%
11+	30	262	11%
Total	50	409	12%

Based on the table above we assumed that over the course of seven years, up to 18% of disabled members under age 62 would ultimately receive Social Security offsets. We developed the following table which varies by duration of disability as of the valuation date and duration from the valuation date for use in our liability model:

Table 4:
Cumulative SSDI Approval Probabilities by Duration
For Claimants under Age 62

Projected Duration	Duration as of Valuation Date							
	1	2	3	4	5	6	7	8+
1	0%							
2	1%	0%						
3	2%	0%	0%					
4	6%	3%	3%	0%				
5	12%	9%	9%	3%	0%			
6	16%	14%	14%	8%	1%	0%		
7	17%	15%	15%	9%	3%	0%	0%	
8+	18%	16%	16%	10%	4%	1%	0%	0%

Separation Offsets

We estimated separation offsets for those under age 50 who did not have 40.63 benefits. We started by analyzing the proportion of individuals disabled under age 50 who received a separation offset.

Table 5: Proportion Approved for Separation Offsets Disabled before Age 50			
Duration (Years)	**Number with Offset**	**Number Eligible**	**Proportion**
1	0	4	0%
2	1	16	6%
3	6	40	15%
4	7	52	13%
5	6	57	11%
6	7	63	11%
7	8	59	14%
8	10	54	19%
9	7	43	16%
10	10	44	23%
11+	293	337	87%
Total	305	402	76%

Based on this information we assumed that, over the course of three years, up to 15% of individuals would ultimately receive separation offsets. We developed the following table which varies by duration of disability as of the valuation date and duration from the valuation date for use in our liability model:

Table 6: Cumulative Separation Approval Probabilities by Duration For Claimants Disabled before Age 50				
Projected Duration	**Duration as of Valuation Date**			
	1	2	3	4
1	0%			
2	3%	0%		
3	11%	5%	0%	
4	15%	9%	0%	0%

Worker's Compensation & Earnings Offsets

We analyzed historical worker's compensation and earnings offsets based on claimants as of December 31st, 2016 who did not have these offsets. We then looked forward at each consecutive year-end listing through December 31st, 2021 to estimate the amount of worker's compensation and earnings offsets these claimants eventually received. We determined that this amount was negligible and have decided that we will no longer include estimated offsets for worker's compensation benefits and return-to-work earnings.

Offset Amounts

In addition to estimating the probability of receiving benefit offsets, we also estimated the amount of these offsets as a portion of the gross benefit amount. These amounts are shown below and are based on the reported offsets on the historical claim listings from December 31st, 2016 through December 31st, 2021.

Table 7: Estimated Offset Amounts As a Portion of Gross Benefit	
Offset	**Percent of Gross Benefit**
Retirement	35%
Social Security (Under Age 62)	42%
Social Security (Age 62 or Older)	22%
Separation	5%

Estimated Social Security offset amounts vary by age due to applicants being required to apply at age 62 for Social Security retirement benefits, which are lower on average than Social Security disability benefits. Note that no monthly benefit can be offset by more than 100% and that some of these offsets are mutually exclusive.

Claim Termination Rate Study

We performed an actual to expected claim termination rate (CTR) study based on historical experience from January 1st, 2017 through June 30th, 2022 as of September 30th, 2022. We performed this study for both employees and survivors separately.

The expected basis was developed from GRS's *Wisconsin Retirement System: Three Year Experience Study January 1, 2018 – December 31, 2020* report. We assumed that there would be no recoveries for this block and that mortality is the only decrement. Employee mortality is based on a blend of healthy life and disabled life mortality because the definition of disability for 40.63 benefits is stricter than the Duty Disability definition. Spouse mortality was based on healthy life mortality only.

We calculated the A/E ratio as the number of actual deaths over the study period divided by the number of deaths that would have been expected based on the amount of exposure each individual had in the study. There were few deaths over the study period and therefore we did not attempt to split the results by age or gender. Employee deaths totaled 108 and implied an overall mortality rate of about 85% of the expected table (or 76% when weighted by indemnity). There were only eight survivor deaths in the study period and therefore we do not believe that the results of this study were meaningful.

Duty Disability Death Benefit Study

We conducted a death benefit study to determine what portion of employee deaths result in payments to survivors, because the disabled member must die of the same condition that triggered the Duty Disability benefit to trigger a survivor benefit. We also researched national statistics on children and families to estimate a liability for future child benefits.

Based on the file "DutyDisability1Demo Backup 2021-12-31.accdb" we calculated the total number of deaths and death benefits paid. Due to considerable uncertainty with the data, we considered multiple ways to tabulate deaths and ultimately assumed that 25% of employee deaths would result in a benefit payable to dependents.

In addition to this study, we identified several key statistics based on various government sources:

- We assumed 1.6 children per employee based on the U.S. fertility rate in 2020. This was based on information from the World Bank as reported by the Federal Reserve Bank of St. Louis.
- Because the fertility rate represents the total number of children over time rather than as of a snapshot in time this is a conservative assumption. Therefore, we also assumed that disabled members over age 55 would have no dependent children who would be eligible for death benefits beyond the valuation date.
- We assumed a child mortality rate of 21.73 per 100,000 based on child mortality and population between ages 1 and 18. Data were based on information from the Centers for Disease Control and U.S. Census Bureau.

Overpayment Study

We performed an overpayment study to estimate the proportion of overpayments recovered by ETF for claims with overpayment balances. We projected claims with known overpayment balances as of December 31st, 2021, using the proposed new valuation assumptions. Of the 36 claims with overpayment balances as of December 31st, 2021, we were able to link 33 to a record on the December 31st, 2021 open claim listing. We then developed two separate projections for these claims: one that assumes the overpayments are offset by the net benefit amount, and another that assumes the overpayments are not recovered. The difference between these balances is the present value of the assumed overpayments recovered as of December 31st, 2021. We then compared the projected overpayment recovered to the total overpayment balance as of December 31, 2021, as shown below:

Table 8: Projected Overpayment Balance Recovered For Claims with Known Overpayment Balances As of December 31st, 2021	
Program	**Duty Disability**
Projected Overpayment Recovered	$120,355
Total Overpayment Balance	$129,813
Percent Recovered	92.7%

Because of the lifetime benefit period and high benefit amounts there are many opportunities to recover overpayments. We propose assuming that 92% of the outstanding overpayment balance will be recovered for estimating liabilities for open claims based on the results of this study.

Runout Study

We performed a retrospective runout study to determine what historical margins would have looked like under the proposed new valuation assumptions. The runout study methodology is the same as the methodology for the runout studies routinely performed in our valuation analysis.

Runout margin is calculated as the difference between actual payments discounted to the beginning of the period and expected payments. Expected payments are calculated as the difference between beginning liabilities and the present value of ending liabilities discounted to the beginning of the period. The result is the total margin released after one year. Ideally, liability margins would be between 1-5% meaning that in any given year 1-5% of the total liability is released as surplus.

For the Duty Disability runout study, we do not include the impact of COLA or offsets and claims are weighted equally rather than by indemnity amount. This is because variations in payments, particularly due to COLA, could create annual gains or losses that are unrelated to experience trends.

Because the Duty Disability plan is based purely on mortality rates we focused on aggregate margin rather than margin by duration. A runout study was performed on both the employees and survivors. We tested different claim termination rates until we identified those which produced reasonable margins. Thus the runout study, while initially guided by the claim termination rate study, serves as the primary method of setting claim termination rate assumptions.

Runout studies were performed over each calendar year starting with 2017 and ending with 2021. The results of the runout studies for employees and spouses are shown below:

Table 9: Runout Study for Disabled Members Annual Margin as Percent of Initial Liability	
Experience Period	**Annual Margin**
2017	0.63%
2018	0.04%
2019	0.57%
2020	0.54%
2021	0.72%
Average	**0.50%**

Table 10: Runout Study for Survivors Annual Margin as Percent of Initial Liability	
Experience Period	**Annual Margin**
2017	2.99%
2018	0.91%
2019	0.99%
2020	-0.57%
2021	2.47%
Average	**1.36%**

The new valuation basis uses claim termination rate adjustment factors of 0.5 for disabled members and 0.3 for survivors relative to the GRS mortality tables, and produces positive margins for each experience year for disabled members and positive margin in almost all years for survivors. While the average annual margin for disabled members is not within the 1-5% target range, we feel that the new basis is reasonable because mortality is the only decrement (implying less uncertainty and therefore less need to hold additional margin) and because the plan is not particularly sensitive to the claim termination rates (meaning that claim termination rates need to depart drastically from the claim termination rate study to add margin).

Limitations of Analysis

The analysis in this letter has been prepared solely for the use of Wisconsin ETF, for analyzing Duty Disability experience, under the terms of our contract as amended between Milliman and ETF. It may not be appropriate for other purposes. It may not be shared with any other party without the prior written consent of Milliman. It is a complex, technical analysis that assumes a high level of knowledge concerning the Duty Disability plan. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

In preparing this analysis, we have relied on data provided to us by ETF, including historical claim data and plan design information. We have not audited or verified this information, but we have reviewed the information for reasonableness. To the extent that any of this information is incomplete or inaccurate, the results of our analysis may be materially affected.

This report contains results from various studies performed by Milliman based on historical plan experience. The results discussed in this letter are based on actuarial assumptions about future claim experience and models developed for the purpose of generating these assumptions and projections. It is highly likely that future experience will vary from these assumptions, meaning that the actual claim costs may be either higher or lower than those described in this letter.

We, Maxwell Berube and Paul Correia, are actuaries at Milliman, Inc. and members of the American Academy of Actuaries. We meet the qualification standards from these organizations to render the actuarial opinion contained herein.

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