Anwar Associates
Consulting Actuaries

University of Science & Technology (USTB)

Bannu

Employees' Pension Fund

Actuarial Valuation Report as at 30.06.2020

Monday, May 3, 2021

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1 Overview

This Actuarial Valuation Report (herein referred to as a 'Report') has been prepared at the request of University of Science & Technology, Bannu (USTB) to present the Actuarial liabilities for USTB's, Employees' Pension Benefit Plan, as at June 30, 2020.

USTB provides Benefits to the employees as per the Benefit Rules, shown in Plan Provision section of this Report.

All our Actuarial calculations are based on the data provided by USTB's management in the written form and through oral communication.

This Report is solely for the use of the Management and the Auditors of USTB. It may not be modified, incorporated into or used in other material, sold or otherwise provided, in whole or in part, to any other person or entity, without our permission.

It is requested that USTB Management may kindly notify us promptly after receipt of this Report, if it is aware of any additional information that may affect the results of this Report.

2 Compliance with Professional Actuarial Standard

This Report complies with the Professional Actuarial Standards, prescribed by The Pakistan Society of Actuaries (PSoA), as in the Guidance Notes mentioned below:

- Guidance Note 6 (GN6): General Actuarial Practice
- PSoA Guidance Note 3 (GN3) and Guidance Note (GN4): Assumptions

3 Scope of Work

Brief description of the scope of work is as follow:

- Calculation of Actuarial Liability in respect of existing Pensioners and active Employees as at June 30, 2020
- Determination of the Funding Deficit as at June 30, 2020
- Determination of the Required Annual Contribution rate payable by USTB as a percentage of Pensionable Salary to meet the cost of the future accrual.
- Determination of the projected Pension payments including Commutation for the next 30 years.

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4 Data and Information

4.1 Employees/Pensioners Data

The following key fields were received in respect of each active employee as on the Valuation Date:

- Employee Code
- Employee Name
- Date of Birth
- Date of Appointment
- Designation
- Basic Pay Scale
- Eligible Salary for Pension Benefits

4.2 Data and Information

Verification of each aspect of each individual employee's data was not undertaken, however, the total data was reviewed for overall reasonability and consistency. All our queries, in this respect, were clarified by the Management, to our satisfaction.

4.3 Key Statistics

The tables below summarize the number of employee/pensioners records received and included in the Valuation:

Valuation Date	Total Number of Employees	Total Monthly Eligible Salary in PKR	Average Age in Years	Average Past Service from date of Appointment in Years	Average Monthly Salary in PKR
30 June 2020	448	14,427,500	39	10.5	32,204

Valuation Date	Total Number of Pensioners	Total Monthly Eligible Pension	Total Monthly Eligible Medical Allowance	Average Age
30 June 2020	1	9,276	2,319	58

4.4 Pension Plan Assets:

All amounts shown in the below table are in PKR and rounded to the nearest million.

	Fair Value of Plan Assets	FY ending June 30, 2020
1	Cash at Bank	40.265
2	Investment in TDR	489.323
3	**Total**	**529.588**

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5 Valuation Assumptions

For the purpose of calculating the Actuarial liabilities, certain financial and demographic assumptions are used, as per the Guidance Notes issued by the Pakistan Society of Actuaries (PSoA), from time to time. The Financial assumptions, relate to the discount rate and the future rate of salary increases, whereas the Demographic assumptions, relate to expected Mortality rates and Employee turnover rates

These assumptions may differ from one Actuarial Valuation to the next because of changes in mandated requirements, economic conditions and Plan experience. However, a change in assumptions is not an indication that prior assumptions, whenever made, were unreasonable.

5.1 Discount Rate

The Discount Rate used to calculate the Actuarial Liabilities of the Projected Benefits is as recommended in the Circular issued by PSoA Discount Rate Committee on July 2, 2020, which varies according to the weighted average duration of the Plan.

Based on the weighted average duration of the Plan which turns out to be **30 Years**, we have used a Discount Rate of **10.25%** per annum.

5.2 Expected Salary Increase

The experience shows, that usually the future rate of Salary increases and Discount rates are inter-related, since during periods of inflation or otherwise, both tend to rise somewhat in conformity with each other, but generally salaries at a lessor pace.

Thus, taking into consideration the Discount rate being used, it has been assumed that the Salaries would increase at an average rate of **9.25%** per annum compound, on long term basis.

For general information, it may be submitted, that as regards the Actuarial liabilities, it is the difference between these two rates that matter, and not their individual values in isolation.

5.3 Expected Pension Increase

It is assumed that monthly pension will increase at an average rate of **8.25%** per annum compound, on long term basis

5.4 Expected Medical Allowance Increase

It is assumed that Medical Allowance will not increase in future.

5.5 Expenses of Management of Pension Fund

It is assumed that expenses related to the management of the Pension Fund will be borne by USTB.

5.6 Mortality Rates

The Mortality Table SLIC (2001-05) with 1 year setback, based on the experience of the lives insured with State Life Insurance Corporation of Pakistan, has been used in determining the Liability in respect of the Benefits payable under the Plan.

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Specimen Mortality rates are given in Annexure B attached.

5.7 Withdrawal Rates

Based on our provisional analysis of the experience of different Domestic Organizations, in this respect, we have used the Age wise Withdrawal rates as given in Annexure B attached.

5.8 Cash-flow Projection Assumptions

Cash-flow projections of future pension payouts are based on a number of assumptions, which include the following assumptions in addition to above demographic and financial assumptions.

5.9 Nature of the Fund

A closed pension set is assumed, that is, no new entrants will enter the group.

5.10 Plan Benefit Rules

It is assumed that the current benefit rules will not change for the period for which the cash-flow projections have been made.

6 Actuarial Calculation Method

International Accounting Standard (IAS 19), prescribe the Projected Unit Credit (PUC) method to value such employee benefits, by reference to their projected amount at the date of payment.

This involves **projecting** each **unit** of benefit earned over a period plus earlier periods, to leaving service, retirement, death or other future exit states, allowing for probabilities of reaching those states, also allowing for salary escalation over time, and then discounting those benefits to the Valuation date.

The resultant estimated liability amount reflects full expected service cost, to each of leaving service, retirement or death, or other exit states.

The Current Service Cost is determined by dividing, for each employee, their total liability by total expected service and then aggregating the Current Service Cost for all members. The Current Service Cost can be viewed as the cost accruing over the next year, allowing for escalation and discounting to the different possible dates of payment.

To determine the Defined Benefit Obligation ("DBO"), we subtract from the total estimated liability the Current Service Cost multiplied by expected future service. This is, in effect, the liability that should be held at the Date of the Valuation, for service and benefits accrued up to the date of the Valuation.

Differences between expectations and fact emerge as actuarial gains or losses and are amortised immediately the next year.

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7 Actuarial Results

Below are highlight of the results as at June 30, 2020.

7.1 Accrued Actuarial Liability

Total Accrued Liability in respect of past service of USTB Employees & Pensioners as at June 30, 2020 is as follow:

All amounts shown in the table below are in PKR and rounded to the nearest million.

	USTB Employees' Defined Pension Benefit Obligation	FY ending June 30, 2020
1	Active Employees	1,943.740
2	Pensioners	2.917
3	**Total Accrued Liability**	**1,946.657**

7.2 Sensitivity Analysis

Below are highlight of the sensitivity analysis performed on Accrued Actuarial Liability as at June 30, 2020.

All amounts shown in the table below are in PKR and rounded to the nearest million.

	Sensitivity Analysis	FY ending June 30, 2020	%age Change in DBO
1	Defined Benefit Obligation (DBO)	1,946.657	
2	1% Increase in Discount rate	1,465.333	-24.73%
3	1% Decrease in Discount rate	2,623.515	34.77%
4	1% Increase in Salary Increase rate	2,332.464	19.82%
5	1% Decrease in Salary Increase rate	1,626.542	-16.44%
6	1% Increase in Pension Increase rate	2,191.337	12.57%
7	1% Decrease in Pension Increase rate	1,750.721	-10.07%
8	1Year Mortality Set Back in used rate	1,927.497	-0.98%
9	1Year Mortality Set Forward in used rate	1,833.774	-5.80%

7.3 Pension Fund Surplus (Deficit) Analysis

The Deficit in Pension Fund as at June 30, 2020 is as follow:

- Total Accrued Actuarial Liability in respect of past service of USTB employees as at June 30, 2020 amounts to **PKR 1.946 billion.**
- Total Value of Employees' Pension Fund, as intimated by the USTB, is **PKR 529.588 million.**
- Thus there is a Deficit in Pension Fund of **PKR 1.416 billion** as at June 30, 2020.

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7.4 Cash-Flow Projections

The expected commutations, pension and medical allowance payments over the next **30** years for current employees/pensioners is as follow:

All amounts shown in the table below are in PKR and rounded to the nearest million.

Expected total benefit payments	Commutation	Medical	Pension	Grand Total
Year 1	-	0.028	0.111	0.139
Year 2	1.415	0.081	0.504	2.000
Year 3	0.673	0.106	0.726	1.505
Year 4	3.187	0.232	1.649	5.068
Year 5	-	0.232	1.777	2.009
Year 6	7.352	0.525	3.911	11.788
Year 7	1.968	0.617	4.749	7.334
Year 8	4.673	0.800	6.385	11.858
Year 9	4.939	1.009	8.218	14.166
Year 10	4.767	1.231	10.142	16.140
Year 11	10.318	1.638	13.632	25.588
Year 12	41.679	3.169	25.450	70.298
Year 13	54.988	5.229	41.542	101.759
Year 14	59.919	7.444	60.450	127.813
Year 15	124.915	12.069	98.085	235.070
Year 16	91.341	15.567	129.996	236.905
Year 17	102.941	19.530	166.477	288.947
Year 18	144.024	25.109	218.262	387.395
Year 19	292.229	36.267	313.332	641.828
Year 20	342.408	49.671	429.943	822.022
Year 21	520.569	69.781	603.695	1,194.045
Year 22	295.912	81.058	729.795	1,106.765
Year 23	355.544	94.990	882.520	1,333.054
Year 24	425.580	111.529	1,070.539	1,607.648
Year 25	358.850	125.569	1,256.251	1,740.670
Year 26	361.263	140.258	1,456.505	1,958.026
Year 27	501.020	160.301	1,720.882	2,382.203
Year 28	429.580	177.619	1,978.130	2,585.329
Year 29	375.096	192.185	2,240.009	2,807.290
Year 30	223.854	201.194	2,487.289	2,912.338

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8 Conclusion and Recommendations

The Pension Fund of USTB is in **Deficit** as at June 30, 2020.

To adequately fund the costs pertaining to the Pension Benefits, the following Monthly Contributions and lump-sum payments are recommended:

a) There is a Deficit in the Pension Fund of **PKR 1.416 billion** as at June 30, 2020**.** It is recommended that USTB may make annual contributions of **PKR 545.080 million** over the period of next three years or annual contributions of **PKR 358.295 million** to the Fund, over the period of next five years. These figures are based on the assumption that the average return on the Fund will not be less than **10.25%** and the annual contributions will be made in the middle of the year.

b) To fund only the future accrual of Pension Fund benefits, USTB may contribute to the Pension Fund at the rate of **67.00%** of the Pensionable salaries of the covered employees.

c) However, in lieu of the above mentioned contributions, USTB can make contribution to the Pension Fund at the rate of **143.79%** of the Pensionable salaries of the covered employees, to fund the future accrual and existing deficit of Pension Benefits in the Fund.

d) The actuarial liabilities and future funding costs are determined using various financial and demographic assumptions which may change over time. Since the actuarial liabilities of Defined Benefit Pension Funds are highly sensitive to these assumptions, therefore, regular Actuarial Valuations (at least after every two years) of such Funds are recommended to be conducted to devise future funding strategy.

Risks associated with Defined Benefit Plans are shown in Annexure C.

It will be a pleasure for us to answer any questions on any aspect of this Report, or to provide explanations or further details as may be appropriate.

Thanks for all the cooperation provided in the preparation of this Report.

ANWAR ASSOCIATES CONSULTING ACTUARIES

Ch. Mohammad Anwar, FIA, FLMI. FPSA
Chief Executive Officer and Chief Actuary

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Annexure A – Plan Provisions

We have used and relied on the Pension Benefit plan provisions, supplied by USTB and are summarized below:

USTB is solely responsible for the validity, accuracy and comprehensiveness of this information. If any plan provisions supplied are not accurate and complete, the valuation results may differ significantly from the results that would be obtained with accurate and complete information.

Following is a summary of the benefits payable from the Pension Fund.

- The Normal Retirement Age is 60 years.
- Early retirement is possible after 25 years of service.
- No benefit will be paid if service is less than 5 years.
- On Normal Retirement at age 60 if service is greater than 5 but less than 10 years, a lump sum gratuity will be paid which is last drawn pensionable pay multiplied by pensionable service.
- Minimum qualifying service for pension on normal retirement or death in service is 10 years.
- Monthly Pension will be calculated as follow:
  Last drawn monthly Basic Pay multiplied by 7/300 multiplied by the number of years of pensionable service completed, subject to a maximum of 30 years of service.
  The net effect will be that for 30 years of service, the pension will be 70% of the last drawn pensionable pay.
- No Benefit will be paid on termination as a result of disciplinary proceedings.
- The employee can opt for commutation of up to 35% of his gross pension for a lump sum, at any time at or after retirement. The amount of the lump sum for each rupee of pension commuted will depend on the age at commutation, according to an age-wise scale prescribed. According to the current commutation table, the factor for age 60 next birthday is 12.3719. If the employee applies for commutation while in service within one year of the date of retirement he is allowed the commuted value using the factor for age 60 next birthday.

  The retiree shall be entitled to pension restoration of their commuted part with indexation after lapse of number of years of commutation factor.

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- On death in service before 10 years' of service but after at least 5 years, Gratuity of 1.5 month's last drawn pensionable pay, for each year of service will be paid to the heirs.

- On death while in service, having completed at least 10 years of service, Gratuity in lieu of 25% of the gross pension will be payable to the heirs. Gratuity will be calculated using the commutation factor applicable to the deceased employee's age next birthday at death. In addition, the widow will get a family pension of 75% of the Gross Pension for life or till her remarriage. In the case of the widow's death, the Family Pension will be paid to the sons until age 21 or the daughters till their marriage or attainment of age 21, whichever is earlier.

- On death after retirement of the pensioner, Family Pension of 75% of the deceased employee's pension after surrender or commutation will be paid to the widow or the sons or unmarried daughters under 21.

- All the retirees retiring in Basic Pay Scales (BPS) 16 to BPS-22 and in BPS 1 to BPS 15 are entitled to Medical Allowance at the rate of 20% and 25% respectively of the net monthly pension at the time of retirement. Medical Allowance amount is increased by 25% immediately for new pensioner.

- As per Government Circular, Net Pension amount is to be indexed immediately by 15%, 10%, 10%, 10%, 10% and 7.5%. This gives an effective increase of 81% for new pensioners.

- Following is the age based commutation table showing commutation factors:

Age	Commutation Factors	Age	Commutation Factors	Age	Commutation Factors
20	40.5043	34	29.8343	48	19.6653
21	39.7341	35	29.0841	49	18.9841
22	38.9653	36	28.3362	50	18.3129
23	38.1974	37	27.5908	51	17.6526
24	37.4307	38	26.8482	52	17.0050
25	36.6651	39	26.1009	53	16.3710
26	35.9006	40	25.3728	54	15.7517
27	35.1372	41	24.5406	55	15.1478
28	34.3750	42	23.9126	56	14.5602
29	33.6143	43	23.1840	57	13.9888
30	32.8071	44	22.4713	58	13.4340
31	32.0974	45	21.7592	59	12.8953
32	31.3412	46	21.0538	60	12.3719
33	30.5869	47	20.3555		

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Annexure B – Mortality & Withdrawal Rates

The Mortality and Withdrawal rates used in valuing the liabilities are as follow:

Mortality	SLIC (2001-05) Individual Life Ultimate Mortality Table with one year setback				
Table of Sample Rates (Both Rates are as per Thousand)					
Attained Age	MORTALITY	WITHDRAWAL	Attained Age	MORTALITY	WITHDRAWAL
20	0.96	100	61	17.50	-
21	0.97	86	62	18.88	-
22	0.99	97	63	20.28	-
23	1.01	65	64	21.68	-
24	1.03	44	65	23.05	-
25	1.06	30	66	24.39	-
26	1.08	48	67	25.69	-
27	1.12	31	68	27.51	-
28	1.15	20	69	29.46	-
29	1.19	14	70	32.25	-
30	1.24	10	71	35.33	-
31	1.29	7	72	38.76	-
32	1.35	16	73	42.42	-
33	1.41	10	74	46.38	-
34	1.49	7	75	50.70	-
35	1.58	5	76	55.44	-
36	1.68	3	77	60.65	-
37	1.79	3	78	66.23	-
38	1.92	8	79	72.23	-
39	2.08	5	80	78.71	-
40	2.25	4	81	85.71	-
41	2.45	3	82	93.28	-
42	2.67	2	83	101.39	-
43	2.93	2	84	110.05	-
44	3.22	2	85	119.26	-
45	3.55	14	86	129.04	-
46	3.93	16	87	139.42	-
47	4.36	18	88	150.66	-
48	4.84	21	89	162.61	-
49	5.38	23	90	175.32	-
50	5.99	25	91	188.99	-
51	6.67	23	92	203.97	-
52	7.42	21	93	220.61	-
53	8.24	19	94	239.47	-
54	9.15	17	95	260.84	-
55	9.40	15	96	284.96	-
56	10.13	13	97	312.35	-
57	11.20	11	98	343.66	-
58	12.34	9	99	379.21	-
59	13.54	8	100	419.67	-
60	14.81	1000			

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Annexure C - Risks associated with Defined Benefit Plans

USTB through its Defined Benefit Pension Plan will be exposed to a number of risks, the most significant of which are detailed below:

- Discount rate risk

The risk of changes in discount rate may have an impact on the Plan Liability.

- Salary increase / inflation risk

The risk that the actual salary increase are higher than the expected salary increase, where benefits are linked with final salary at the time of cessation of service, is likely to have an impact on liability.

- Mortality risk

Actual mortality experience maybe different than that assumed in the calculation.

- Withdrawal risk

Actual withdrawals experience may different from that assumed in the calculation.

- Pension increase risk

The risk that the actual pension increase are higher than the expected, where benefits are being paid in form of monthly pension, is likely to have an impact on the Plan Liability.

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