

ASIAN DEVELOPMENT BANK

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**RSC-C71322 (PAK): PUNJAB GOVERNMENT
PENSION SCHEME**

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Executive Summary

1. The primary objectives of the current assignment as outlined by Asian Development Bank are :
 - i. Conduct a preliminary actuarial valuation of Punjab Government Pension Scheme based upon the data sources currently available (mainly PIFRA);
 - ii. Carry out cash flow projections of Punjab Pension Fund over the next 15-20 years;
 - iii. Carry out sensitivity analysis of key assumptions on pension liability and cash flow projections;
 - iv. Make recommendations for funding requirements for Pension Fund, based upon above findings; and
 - v. Outline key parameters and time frame for conducting a comprehensive analysis when Civil Service Census is completed.
2. Punjab Government has set up a Pension Fund in March, 2007 to develop a funding mechanism for the burgeoning pension liability. It is targeted to accumulate Rs.100 billion in the Pension Fund in the next few years (by year 2016) with the purpose and expectation of meeting annual cash outflows of the Pension Scheme from investment income of the Fund (i.e. making pension expense as an off-budget item).
3. In order to fulfil the above objective, the Punjab Government needs to know the liability associated with the Pension Scheme and timing and quantum of pension outgoes for at least 15-20 years.
4. An extremely approximate “actuarial exercise” was conducted in 2003, to have an initial idea of the quantum of liability.

The total liability associated with the Scheme as at 30.06.2003 was estimated to be Rs.191.7 billion.

However, figures calculated in this exercise cannot be attached any meaningful credibility because the information available for the exercise was grossly inadequate and a number of extrapolations had to be done from other Government organizations (such as Pakistan Railways) to come up with requisite distributions for active employees and pensioners.

5. In another exercise carried out during December, 2006 and February, 2007, it was identified that adequate data can be collected from PIFRA database, Finance Department and Office of Accountant General Punjab to derive a reasonably more reliable estimate of the pension scheme liability up to the point that Civil Service Census is completed.

The current exercise has acquired data from the above 3 sources.

6. For the current assignment, the information made available to us by the Govt. of Punjab was as follows :

Active Employees

- i. Details of regular and contract employees of **Lahore District** from PIFRA database;
- ii. Number of sanctioned posts for the Province by Grade;
- iii. Number of contract employees for 17 districts.

Retired Employees

- i. Aggregate payout of regular pension (excluding commutation) for 11 months from July, 2006 to May, 2007; and
- ii. Details of pensioners of Lahore District (as per an in-house exercise conducted by Office of AG Punjab).

Importantly, our Firm had active regular employee information from PIFRA database pertaining to 7 districts of Punjab including Lahore (this data was available from another ADB project pertaining to Federal Govt. Pension Scheme). It was decided to use this database, after due verification, because there were only marginal differences as compared to information provided by Punjab Govt. and the data had significantly wider coverage.

7. Different checks performed on the data revealed various anomalies and inconsistencies in PIFRA database. In particular, there were a number of errors in the category of date of birth. As an example, for Faisalabad districts (which appeared to have maximum errors), 53% of employees were age 23 years. This was clearly a result of dummy age entries for such employees.

Such records were discarded and appropriate adjustments made in the derived distributions.

8. A very important aspect to note is that Lahore district had a significantly different past service pattern compared to the other 6 districts (Faisalabad, Rawalpindi, Jhelum, Gujranwala, Sahiwal and Bahawalpur).

This can be seen from the following comparison:

Average age of employees	Average past service of employees (in years)		
	Lahore district	All districts excluding Lahore	All districts including Lahore
60	17.1	29.8	22.9
50	13.6	24.3	19.1
40	12.8	17.2	15.8

It can be seen that Lahore district has significantly lower past service pattern as compared to other districts. As an example, the average past service of Lahore at age 60 is 12 years less than the other districts, and this trend continues at all ages.

It was assumed that the combined past service pattern of all districts (including Lahore) represents the overall pattern of Punjab Govt. employees.

This assumption can have a significant effect on pension liability, as given below.

9. Based upon the aggregate and individual level information available and after making various adjustments and extrapolations, data sets were created at the Provincial level for active and retired employees.
10. A broad summary of the salient features of the data used to evaluate Punjab Govt. Pension Scheme liability is as follows:

Active Employees

Number	808,844
Total monthly pensionable payroll	Rs.5.535 billion
Average age	41.6 years
Average past service	15.1 years

Pensioners

Total Number	414,737
Current aggregate monthly pension	Rs.886.997 million

10. Although there is a reasonable level of confidence in the constructed database, 2 areas of discomfort are:
 - i. total number of pensionable employees at the Provincial level were not known and needed to be estimated; and

ii. detailed information of only 7 districts was available with data showing significant difference in past service and age distributions between districts.

11. **Based upon the above information base, the accrued liability of Punjab Govt. Pension Scheme (assuming pension indexation of 6% per annum) worked out to Rs.425 billion as at June 30, 2007** (actual rate of indexation provided by the Government over past years is 6.8%). Out of this, Rs.296 billion pertained to active employees with the remainder of Rs.129 billion being associated with pensioners.

In case it is assumed that indexation will occur at a lower rate of 4% per annum, the liability reduces to Rs.369 billion.

12. The above liabilities are based upon the assumption that the past service distribution of employees for the whole province will conform to the combined distribution of employees for 7 districts. If, however, Lahore District is excluded, which has significant lower average past service, the pension liability jumps by **Rs.60 billion to Rs.485 billion**. At the same time, if it is assumed (as an extreme case) that all districts will have same past service pattern as Lahore, the liability reduces to Rs.349 billion.
13. **Although there are varying liability estimates, it can be safely stated that the MINIMUM liability associated with Punjab Government Pension Scheme as at 30th June 2007 is Rs.349 billion.**
14. The accrued pension liability is expected to build up very rapidly in coming years. An approximate estimate of expected pension liability for the next 3 years is given below:

June 30 of Year	Expected Pension liability (Rs. billion)
2007	425
2008	474
2009	523
2010	577

15. There is a significant difference of Rs.100 billion in the current liability estimate as at 30.06.2007 compared to the one calculated in 2003 (based upon 2003 estimate, the liability as at 30.06.2007 would have approximately been Rs.325 billion).

The major reasons for the increase in liability currently calculated are :

- average pensionable salary has increased at the rate of 12.5% per annum during the last 4 years compared to the assumed rate of 8%;
- expected future indexation is assumed at the rate of 6% compared to previous assumption of 4%; and

- iii. employee distributions used as at 30.06.2007 (for Railways employees) are significantly different than the samples of Punjab Govt. employees.
16. A summary of expected cash outgoes related to the Pension Scheme over the next 25 years is:

Year	Expected cash outgo on account of (Rs.billion)		
	Regular Pension	Commutation	Total
2010	12.1	5.4	17.5
2015	18.1	9.7	27.8
2020	29.2	16.8	46.0
2025	50.7	28.4	79.1
2030	82.7	26.5	109.2

17. The expected cash outgoes are very high and build up rapidly over time.

The commutation amount increases to Rs.31 billion upto year 2028 after which it starts to decrease. The regular pension amount increases to a much higher of Rs.157 until year 2051 (significantly longer than commutation) before it starts to decrease gradually.

18. However, an important aspect to be noted is that there is no liability humps in any particular year and the movement of expected cash flows is relatively smooth from year to year.
19. A clear deduction from the above cash flow projections (and liability estimate) is that the funding target of Rs.100 billion assets in Punjab Pension Fund is grossly inadequate in view of the objective of Punjab government to meet pension outgoes from investment income of Fund assets.

Assuming 10% average return on Fund assets, the Fund income can only be expected to cover 32% of cash liabilities in year 2016, 22% in year 2020 and 13% in 2025.

Accumulating Rs.100 billion in the Fund by year 2016, the investment income will merely cover 22% of pension cash-flows over 10 year subsequent period and 18% if the period is extended to 15 years.

20. Punjab Govt. should, therefore, significantly enhance the target to satisfy the objective of covering vast majority of pension expense from Pension Fund income.

In case 100% of pension cash-flows are to be met over a period of 10 years, the Pension Fund will require Rs.465 billion assets in year 2016 (the amount needs to be enhanced to Rs.565 billion if outgoes over 15 year period are to be covered).

21. **In view of the above findings, it is recommended that Govt. enhance the target of Pension Fund assets to a minimum of Rs.350 billion (instead of Rs.100 billion). Even in this case, the investment income from the Fund can be expected to cover 75% of pension outgoes over the next 10 years.**
22. In view of the significant impact on pension liability due to the past service pattern, it would be advisable to repeat the actuarial exercise once approximately 70-75% of Punjab Govt. employees are on PIFRA database.
23. A more comprehensive actuarial exercise should be conducted when the project for Civil Service Census is completed. However, it should be ascertained that the database of the project captures all the information to carry out a detailed actuarial study.

Main Report

Section 1

1.1 Purpose of the Report

This Report provides the results of preliminary actuarial valuation for estimating the extent of pension liabilities and cash flow projections of the Government of Punjab (GoPb) employees, required under Contract A12419, Project RSC – C71322 (PAK) – Punjab Government Pension Scheme. The task has been conducted using the information available from the GoPb's Finance Department, Accounting General's Office and the World Bank's Project for Improvement of Financial Reporting and Auditing (PIFRA) and other relevant sources.

The Report highlights in detail the sources of data, the anomalies in the available data, cash flow projections of the Pension Fund, sensitivity testing of key assumptions, and makes recommendations for the funding requirement for the Pension Fund.

1.2 Background

In 2003, the Government of Punjab (GoPb) formed a working group to study their existing pension and provident fund schemes; to advise what reforms were needed and suggest how such reforms would be achieved.

During the first meeting of the working group held on 5th July 2003, it was decided that, in order to achieve the objectives of the study, it would be necessary to perform a preliminary actuarial valuation to determine the scope and magnitude of the scheme and the associated liability on the Government of Punjab.

Nauman Associates carried out the above mentioned valuation at the behest of the Provincial Government, the results of which were submitted in report CM/L-1955/03 on 26th September 2003 to the working group. This was followed by a second report CM/L-2465/03 on 11th November 2003 containing the Firm's comments, observations and suggestions regarding the GoPb's Pension Scheme.

The results of the exercise carried out in 2003 were very approximate as they were based on minimal information. As such, it has been decided to arrive at a better and up-to-date estimate of the GoPb pension liability by incorporating greater amount of specific information. This is the basic objective of the current exercise.

An exercise subsequent to 2003 was carried out to examine whether more reliable data can be available to arrive at a better estimate of Pension Scheme liability from the existing available sources (before civil service census is completed). It was determined that using PIFRA database for active employees, distribution of pensioners of Lahore district formulated by the AG Office and aggregate level information from Finance Department and AG Office, a more reliable and up-to-date pension liability estimate (and cash-flow projections) can be worked out.

1.3 Data

For the purpose of the actuarial valuation, data was extracted from various sources. After checking for its reasonableness and making appropriate adjustments, the data was used to project the pension liability and cash flow projections of the Government of Punjab (GoPb) employees.

We will now discuss the data that was used:

Active Employees

The detailed data for the active employees was available from the PIFRA database. The information made available from the Government of Punjab included the following:

- **Details of regular and contract employees of the Lahore district (summary attached as Appendix I)**
- **District-wise breakup of contract employees for 17 districts (attached as Appendix II)**
- **Total number of sanctioned posts in the Punjab province (attached as Appendix III).**

However, since the details of employees was only available for one such district, (which was not enough to estimate the liability of all employees of the GoPb), we used information acquired for another ADB pension project for the Federal Government. Information was made available to us only for the regular employees for the following seven districts, the source being the same (i.e. the PIFRA database):

- Lahore District
- Faisalabad District
- Rawalpindi District
- Jhelum District
- Gujranwala District
- Sahiwal District
- Bahawalpur District

(summary attached as Appendix I)

We will now discuss the characteristics of the data available for active employees from all sources, the anomalies found during reasonableness checks, and the data that was actually used after making appropriate adjustments.

1. Data from GoPb:

The data collected from the GoPb constituted the details of Lahore District regular and contract employees. Detailed employee records (consisting of data items such as age, past service, grade, basic pay etc. of each employee) were available. Summary of the data is as follows:

	Number of Employees	Total Monthly Salary (Rs.)
Regular Employees	87,818	559,302,372
Contract Employees	5,738	31,948,914
Total:	93,556	591,251,286

As mentioned earlier, the data from the Lahore District alone was not enough to estimate the liability of all employees of the GoPb. The data collected from the Federal Government was therefore used along with this data, after checking for its reasonableness and making appropriate adjustments (as explained in the later part of the report).

Total number of contract employees for 17 districts of the Punjab province (provided by the GoPb) was 35,037. This total did not pass the reasonableness test, since the number of contract employees for the Lahore District mentioned in the list (3,682) did not match with number of contract employees present in data for Lahore District (5,738). The detailed data was assumed to be more credible and thus the total number of contract employees in the Punjab province was estimated (as explained in the later part of the report).

Total number of sanctioned posts in the Punjab province (provided by the GoPb) was **1,001,969**. This figure was used to estimate the total number of actual employees eligible for pension (as explained in the later part of the report).

2. Data from PIFRA Database for Federal Government Project

Data related to the GoPb employees was extracted from the on going Federal Government pension reforms project. Detailed employee records (consisting of data items such as age, past service, grade, basic pay etc. of each employee) were available for the following seven districts:

- Lahore
- Faisalabad
- Rawalpindi
- Jhelum
- Gujranwala
- Sahiwal
- Bahawalpur

This data too was collected by the Federal Government from the PIFRA database. However, the information for the basic pay was not up-to-date, as the information was collected at an earlier point of time.

Summary of the data is as follows:

	Number of Permanent Employees	Total Monthly Salary (Rs.)
Lahore	86,076	529,132,473
Faisalabad	41,823	254,459,664
Rawalpindi	30,449	178,656,566
Jhelum	10,207	59,389,358
Gujranwala	23,023	139,656,019
Sahiwal	16,840	101,185,357
Bahawalpur	21,465	126,886,421
Total:	229,883	1,389,365,858

This data was checked for its reasonableness (in comparison with GoPb Lahore district data), and appropriate adjustments were made to remove any anomalies. For the valuation purposes, the Lahore data collected from the GoPb along with the data of other districts collected from the Federal Government was used.

We will now discuss in detail the anomalies found in both the GoPb and Federal Government data, and the procedures used to eliminate these anomalies.

Comparison of Lahore Data collected from GoPb and Federal Government

As an initial exercise, the Lahore data collected from the two different sources was mapped onto one another to check for any dissimilarities, so that reasonable confidence could be developed on the data from other districts used in the valuation.

The following table summarizes the key parameters of the Lahore district from both sources:

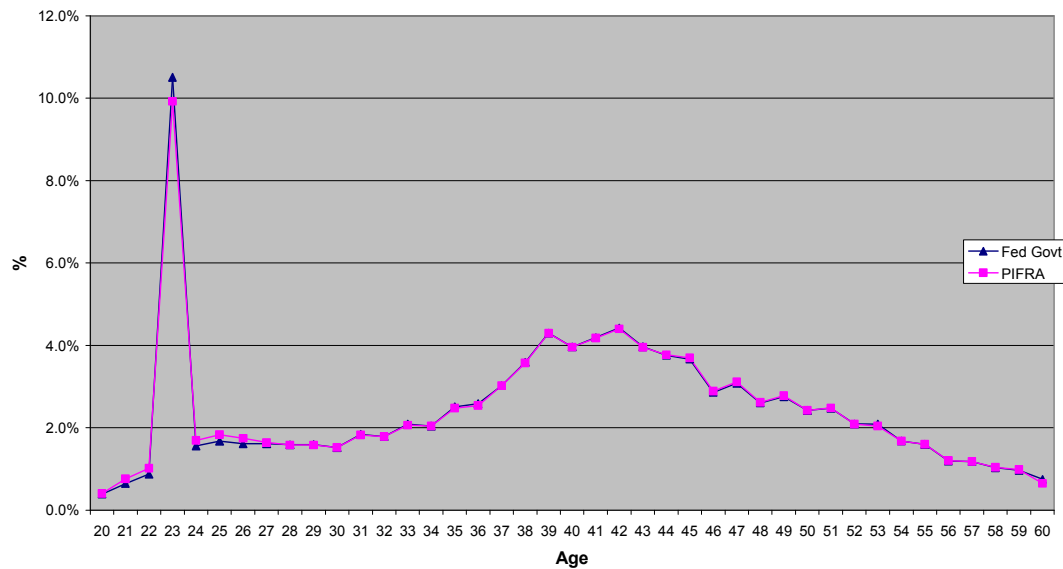
Summary Statistics of Lahore District (Regular Employees)

	Average Age	Average Salary	Average Past Service	Total Number of Employees
GoPb	39 years	Rs.6,950	10.6 years	87,818
Fed. Govt.	39 years	Rs.6,147	10.4 years	86,076
% Difference	0%	13%	2%	2%

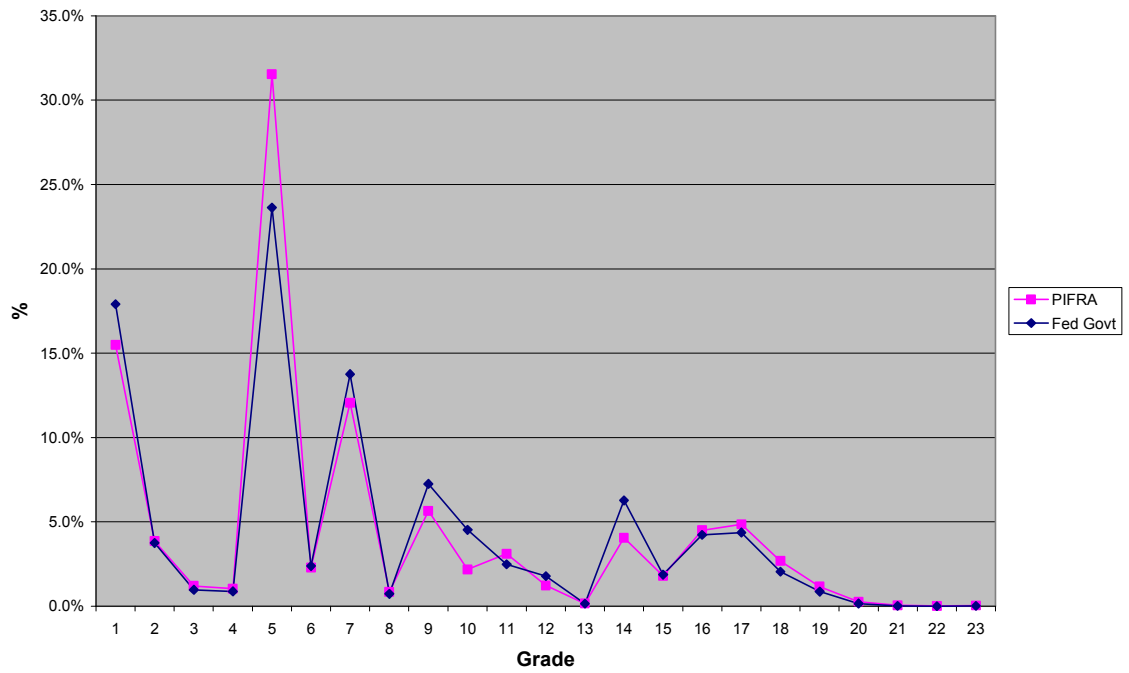
Apart from the average salary, all other statistics give a fair bit of confidence that the data from the two sources is similar. Average salary for the GoPb data is higher since this data was compiled at a later date.

The following graphs also give a good depiction of the fact the data from both sources was notably similar:

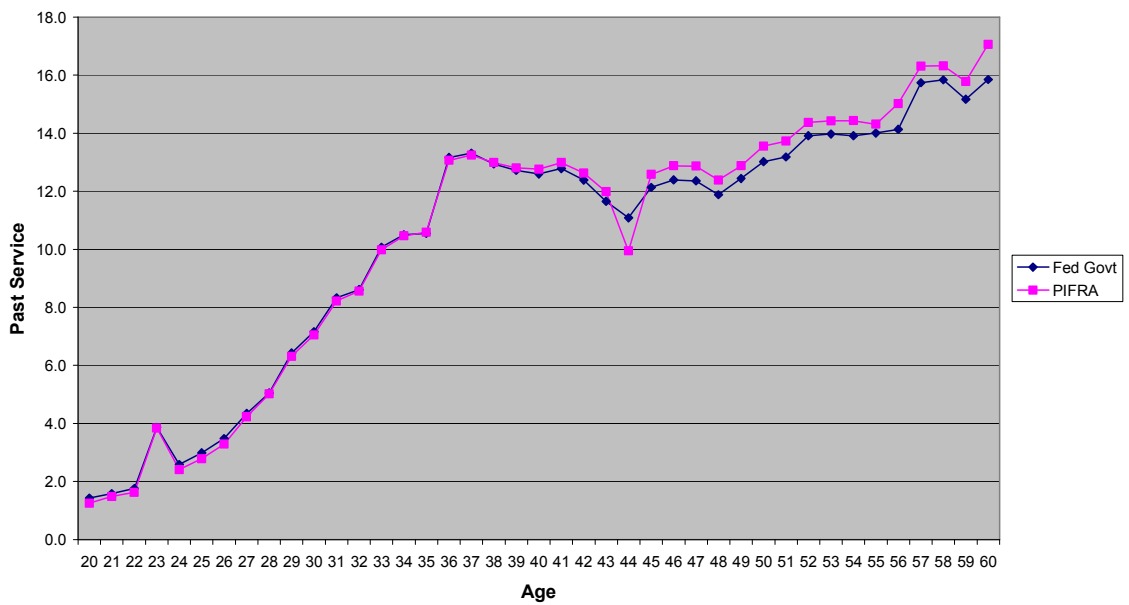
Agewise Distribution



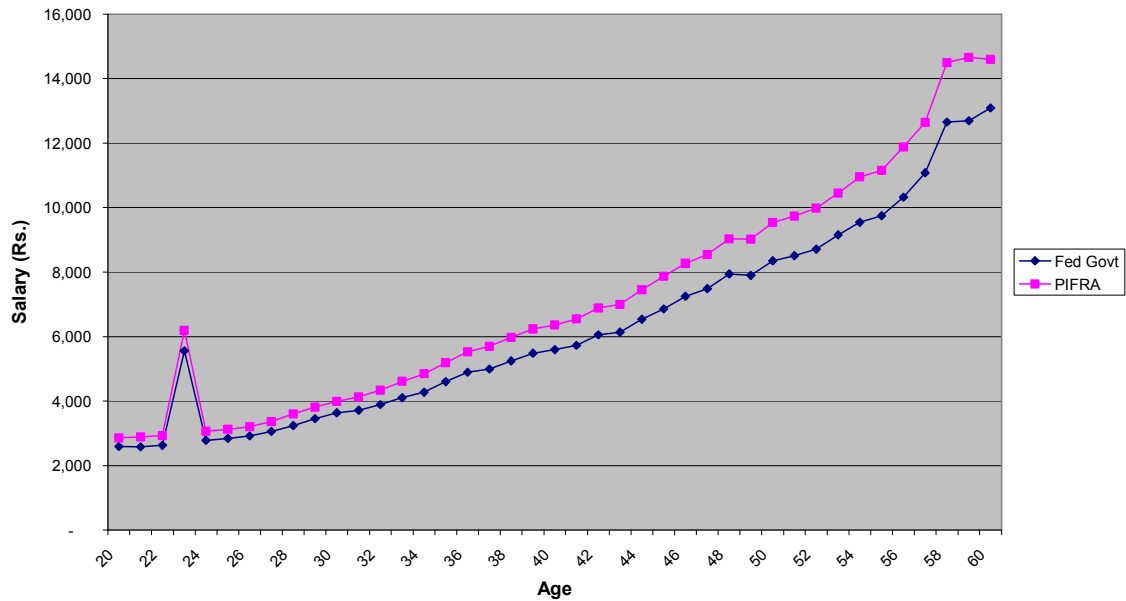
Gradewise Distribution



Past Service Comparison



Salary Comparison

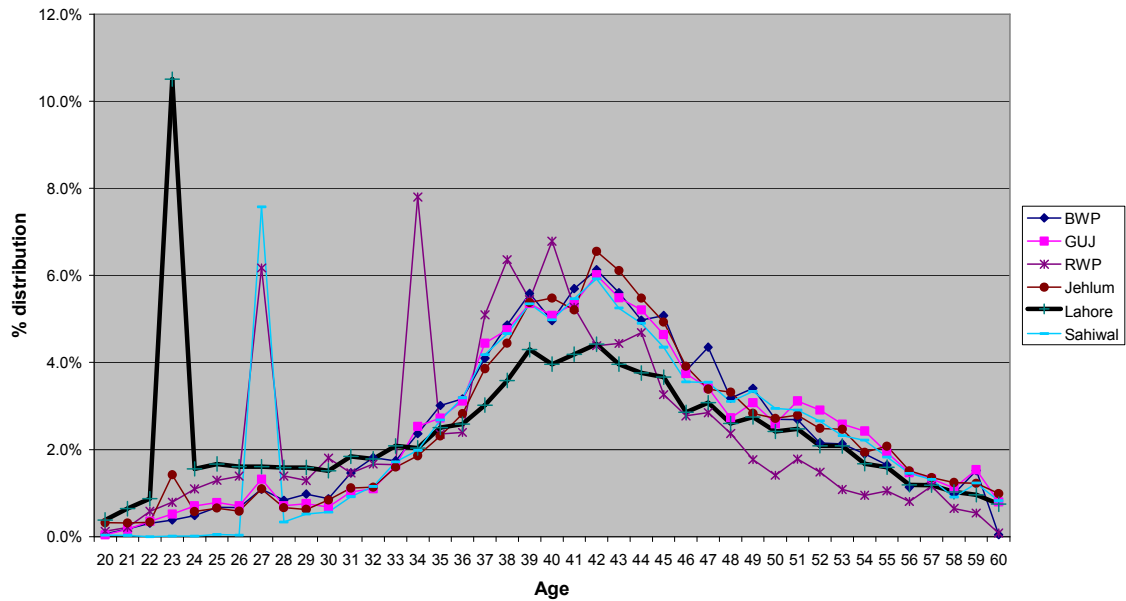


The last graph clearly shows that the average salaries at all ages are relatively higher for the GoPb data as compared to the Federal Government data (due to GoPb data pertaining to a later date). Average salaries for the other six districts were increased proportionally, to make the data for these districts usable (see Appendix IV for the salary increase rates used).

Dummy Data Entries

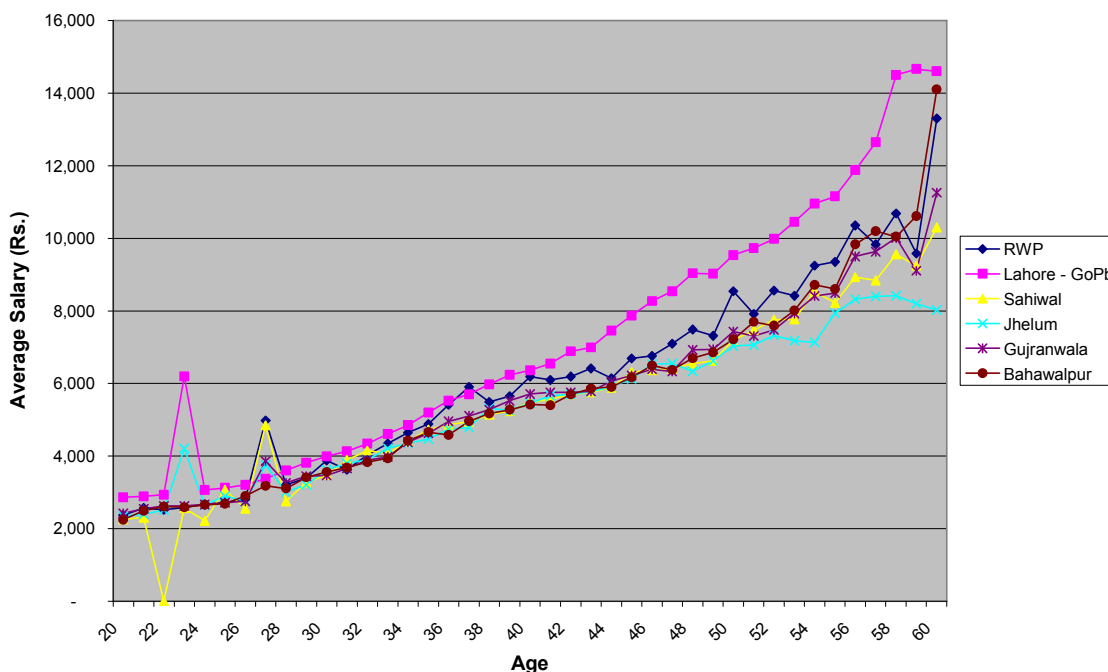
On investigation, it was found that dummy date of births and date of appointments had been entered for a certain number of employees in the PIFRA database, as no such dates were available with them. Such data had been entered in the Lahore, Faisalabad, Rawalpindi and Sahiwal districts for various ages as can be seen in the graph below.

Agewise Employee Distribution for all Districts



The peaks at age 23 in the Lahore district data, age 27 in the Rawalpindi and Sahiwal district data and age 34 in the Rawalpindi district data represent the occurrence of the dummy entries. (Faisalabad district has been removed from the above graph as almost 50% of the data from the district was concentrated at age 23 making it unreliable to be used, and for the very reason this data was not used for valuation purposes). Existence of such dummy entries had also pushed up the average salaries at these particular ages, as can be seen in the following graph:

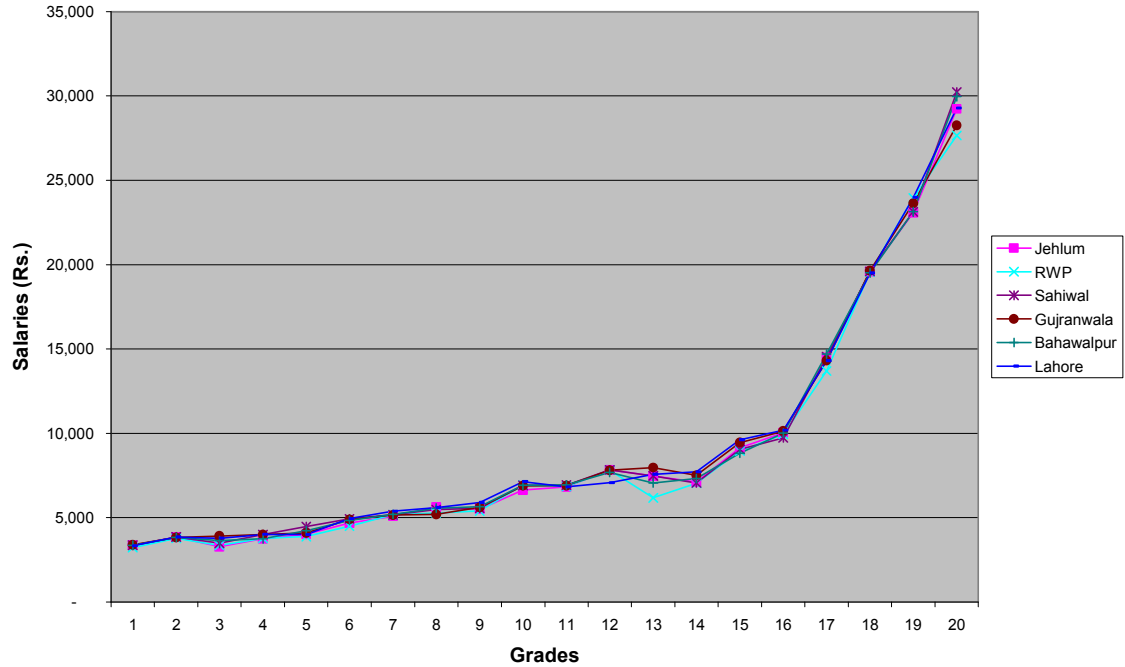
Agewise Salary Comparison of Districts



To remove the effect of dummy entries, percentage distributions at ages 23, 27 and 34 of the effected districts were normalised by replacing them with the percentage distributions at the normal districts (Jhelum, Bahawalpur and Gujranwala) at the effected ages, taking into account the percentage distribution at 1+ and 1- years in the effected districts. To remove the impact of inflated average salaries at these ages, affected average salaries of the Lahore, Rawalpindi and Sahiwal districts were replaced with the average salaries from Jhelum, Bahawalpur and Gujranwala districts taking into account the average salaries at 1+ and 1- years in the effected districts.

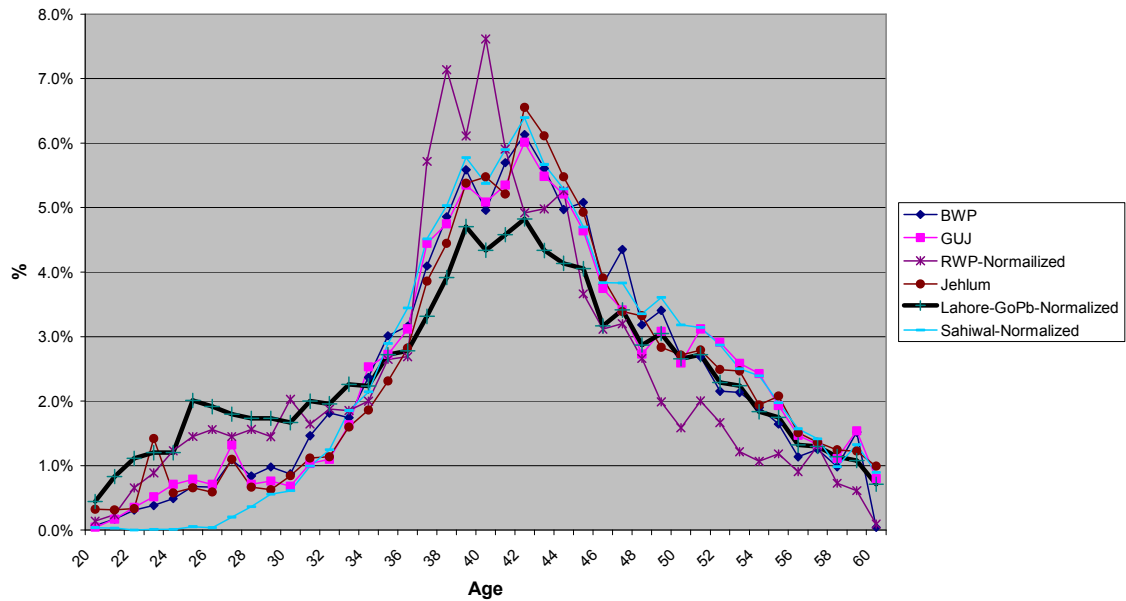
Grade-wise comparison of average salaries for all districts was also made. The results showed great similarity between all districts, further reinforcing the fact the problem only lied in the date of births and date of appointments. The following graph shows the grade-wise comparison of average salaries for all districts.

Grade-wise Comparison of Salaries

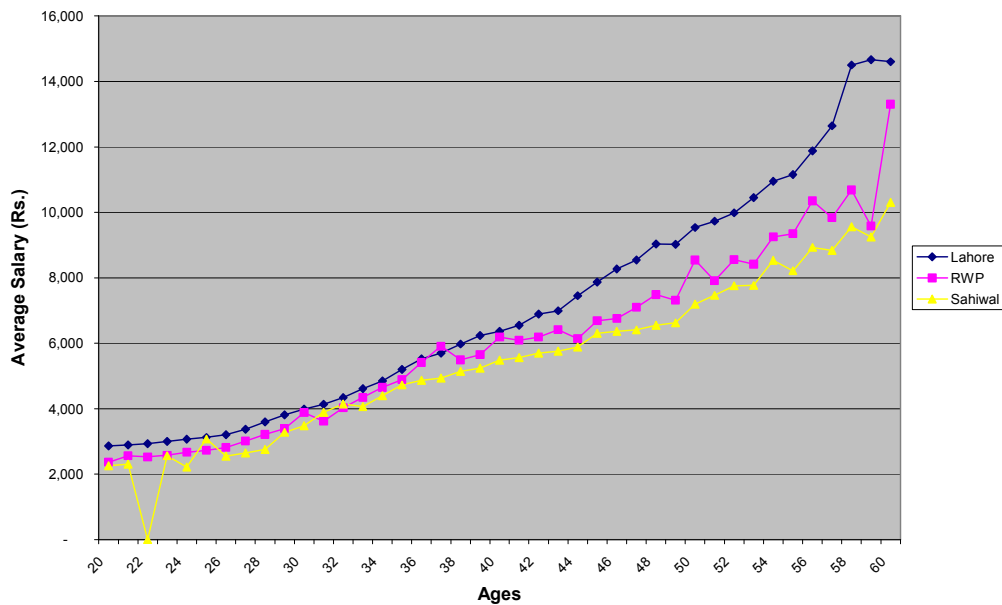


After making the above stated adjustments, the over all age wise distribution of Lahore district (GoPb) and other six districts and the age wise average salaries for effected districts are shown in the following graphs (for the actual figures, please refer to the attached Appendix I):

Agewise Distribution for all Districts After Correction



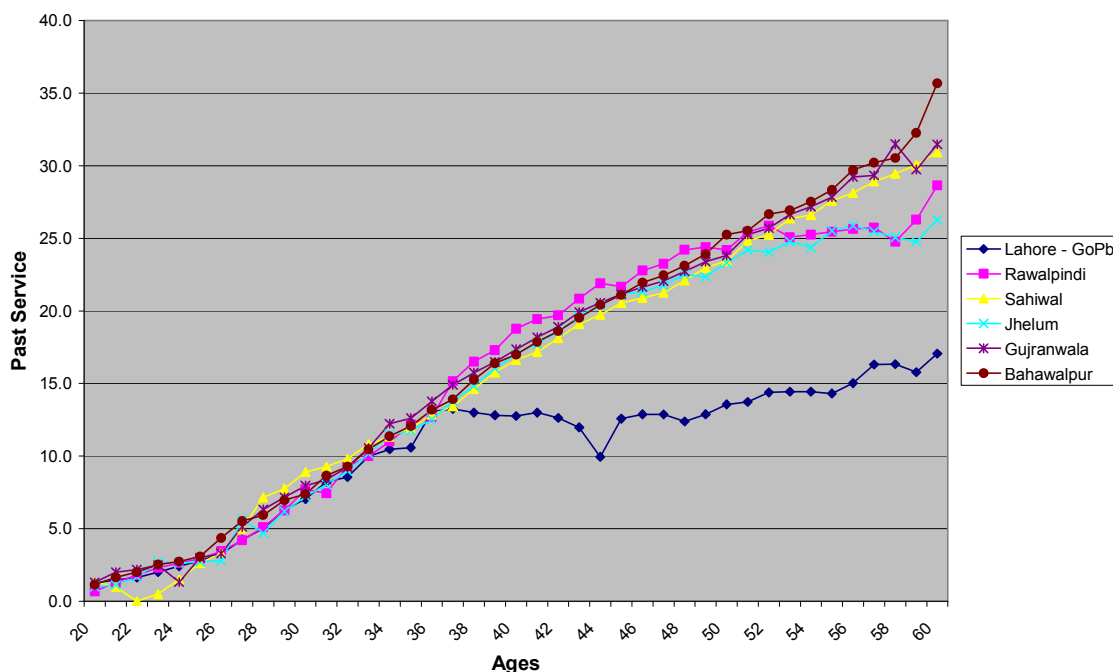
Agewise Salary Distributions for Effected Districts After Correction



Past Service Distribution

Analysis of the data revealed that the past service was not increasing in conformity with the increase in the age of the employees. The problem area was identified as the data from Lahore district. The following graph shows the trend of past service with respect to ages of employees for all districts used in the consolidated data:

Past Service with respect to Age



Thus, for valuation purposes three different sets of past service distributions were used to come with the pension liability of active employees, namely past service distribution I, past service distribution II and past service distribution III. Past service distribution I is based on the average past service with respect to age for the consolidated data **including** the Lahore district data, past service distribution II constitutes average past service with respect to age **excluding** Lahore district data and past service distribution III is based on average past service with respect to Lahore district only.

Sanctioned Posts and Contract Employees

As stated earlier, information related to the number of contract employees and the total number of sanctioned posts was also provided to us by the Government of Punjab (see attached Appendix II).

Total number of sanctioned posts in the Punjab province as provided by the Government of Punjab totalled to **1,001,969**. **However, the exact number of employees actually hired was not available with the GoPb.** For this purpose, the actual number of actual employees were estimated from a similar piece of information provided to us for the earlier exercise conducted in 2003 (see attached Appendix III). The ratio of actual employees to sanctioned posts in 2003 was around **0.86:1** and the same ratio was applied on the current sanctioned posts to estimate the actual number of employees as in 2007, which came out to be **861,693**.

A further reduction had to be made for the contract employees (who are not eligible for pension) to estimate the actual number of **active eligible employees**. In the data provided to us, the total number of contract employees was stated to be around **35,037**. However, in this data, the number of contract employees in the Lahore district was stated to be 3,682, which did not match with the total number of contract employees retrieved from the detailed employees list of the Lahore district also provided by the Government of Punjab (5,738). Therefore this piece of information was discarded, and the total number of contract employees for the Punjab province was thus estimated using the ratio of contract employees to actual employees in Lahore district, and applying the same to the estimated actual number of employees. This came out to be **808,844**.

Summary Statistics of Data Used

The following summarises the data for active employees that was actually used to estimate the pension liability of the active employees of the Government of Punjab:

Total Sanctioned Posts	1,001,969
Estimated Actual Employees	861,693
Estimated Contract Employees	52,850
Total Number of Employees used for Valuation	808,844

Pensioners

The following information was made available for the current pensioners of the Government of Punjab:

- Total pension payouts for Punjab Government (excluding commutations) for 11 months (from July 2006 to May 2007),
- Total number of pensioners (including additions and deletions) from January 2005 to June 2006, and
- Details of pensioners for Lahore district.

1. Total Pension Payouts for Punjab (from July 2006 to May 2007):

The following summarises the information related to payments made to Government of Punjab pensioners for the 11 months from July 2006 to May 2007:

Normal Pensioners	-	Rs.9.6 billion
Family Pensioners	-	Rs.156 million
Total	-	Rs.9.756 billion

The break-up of pension payouts between normal and family pensioners was not reliable; however, the authorities were confident that the total pension payouts for the 11 months amounted to Rs.9.756 billion.

2. Total number of pensioners from January 2005 to June 2006:

Month-wise information of the total number of pensioners of the Punjab province (including addition and deletion of pensioners) was available from the PRMP. The summary of this movement report is attached as Appendix V of the report.

Total number of pensioners as at 30th June 2006 was **405,346**. This figure along with the average increase in pensioners since January 2005 was used to estimate the total number of pensioners as at 30th June 2007, which came out to be **414,737**.

3. Details of pensioners for Lahore district:

The break-up of total pensioners into normal retirees, early retirees, self and family pensioners was not available. To estimate this, data for pensioners for Lahore district was collected from AG Office, Lahore. This data was compiled as result of an exercise conducted internally by the AG Office Lahore. The following summarises the statistics of this data:

Pensioners for Lahore District:

Total Pensioners	-	33,990
Total Gross Monthly Starting Pension	-	Rs.110,277,597
Total Net Monthly Starting Pension	-	Rs.52,989,572

The gross and net monthly pensions had to be increased appropriately using the pension indexations that have occurred since the time of retirement for each individual pensioner. The indexation rates used are attached as Appendix VI of the report.

A significant number of anomalies were found in the Lahore pensioners data, thus, a large amount of entries had to be discarded, so that some crude estimate of the break-up of pensioners for the Punjab province could be made. These anomalies included:

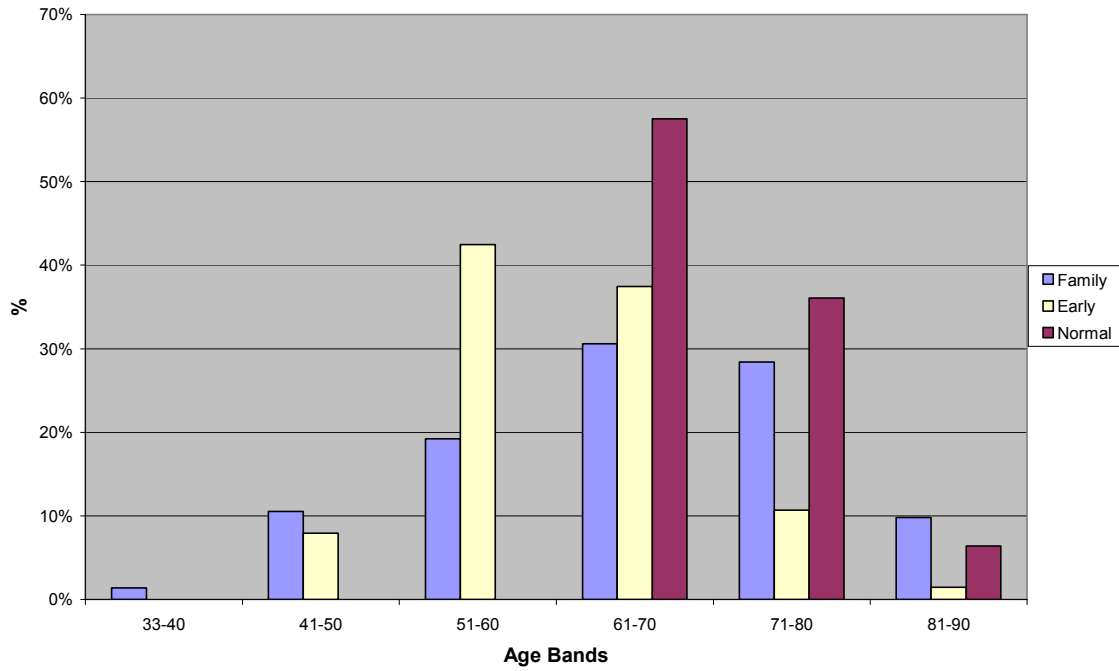
- Mismatch between status (alive/dead), pensioner type (self/family/superannuation) and pension category (self/family/superannuation).
- Mismatch between status (alive/dead) and date of death.
- Mismatch between age at the time of retirement and pensioner type (self/superannuation).

- Mismatch between current age and pensioner type.
- Retirement age greater than 60.
- Current age greater than 95 (a large number of entries were found in the data)
- Retirement age less than 45.
- Missing date of births/date of appointments/ pension amounts

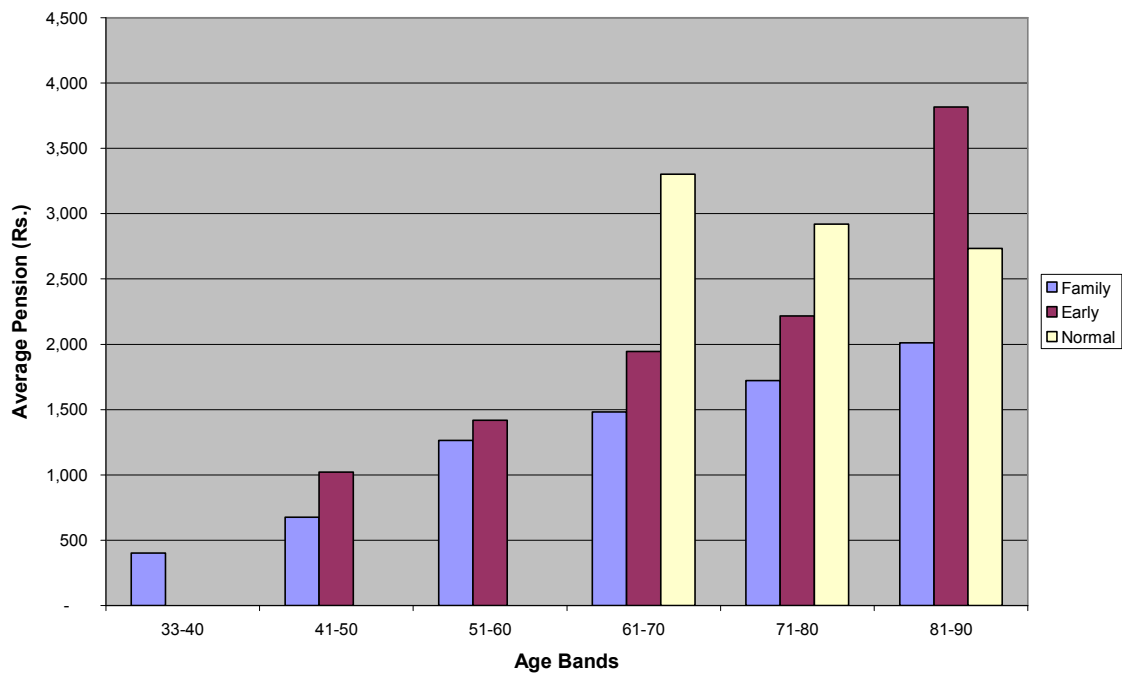
After filtering the data, the remaining **26,084** entries (23% of data entries were discarded) were used to estimate the total number of pensioners in each category for the Punjab province.

It has been assumed that the pensioners' data for the Lahore district is a good representative of the pensioners' population of the Punjab province. The distribution of pensioner's type and average monthly current pension was applied on the total number of estimated pensioners as at 30th June 2007. The following graphs summarise the data that was used after making the above stated assumptions to calculate the liability of the current pensioners of the Punjab province (details are attached as Appendix VII of the report):

Pensioners Agewise Distribution



Average Pensions After Indexation



Section 2

2.1 Data Assumptions

The following has been assumed on the data used for the actuarial valuation:

i. Active Employees

The sample data of active employees was collected from seven districts as mentioned in Section 1 of the Report. Summary statistics of this data are as follows:

District	Number of Permanent Employees	Total Monthly Salary (Rs.)
Lahore	87,818	559,302,372
Faisalabad	41,823	254,459,664
Rawalpindi	30,449	178,656,566
Jhelum	10,207	59,389,358
Gujranwala	23,023	139,656,019
Sahiwal	16,840	101,185,357
Bahawalpur	21,465	126,886,421
Total:	231,625	1,419,535,757

A number of anomalies were found in the data and were accordingly removed as explained in detail in the last section of the Report. The adjusted data was consolidated to provide a base to be used to estimate the parameters of the active employees of the Government of Punjab eligible for pension. It has been assumed that this consolidated data is a good representation of the actual population of active employees in the Punjab province. The following table summarises the estimated parameters of the consolidated data:

Age Bands	Total Number	Total Monthly Salary (Rs.)	Avg. Monthly Salary (Rs.)	Avg. PS	Age Distribution
20-25	8,655	25,977,935	3,001	2.2	4.9%
26-30	11,848	42,651,481	3,600	5.4	6.7%
31-35	18,216	85,983,345	4,720	10.2	10.3%
36-40	39,313	237,982,069	6,054	14.7	22.2%
41-45	43,563	299,370,068	6,872	16.6	24.5%
46-50	27,288	223,658,031	8,196	18.4	15.4%
51-55	19,066	183,612,180	9,630	20.6	10.7%
56-60	9,536	115,459,451	12,108	22.8	5.4%
Total	177,485	1,214,694,561			100%

(age-wise break-up is attached as Appendix I of the report)

The salaries of Lahore district from the GoPb data were found to be higher than those in the Federal Government data at all ages, since the GoPb data pertained to a later date. The salaries of all the remaining districts were therefore increased with the same proportion. The percentage increase applied is attached as Appendix IV of the report.

The information of sanctioned posts, along with the information of sanctioned and actual posts provided in 2003 and information related to contract employees for the Lahore district were used to estimate the total number of eligible employees of the Government of Punjab. The details of the workings are explained in Section 1 of the Report. The total number of estimated employees and their salary used for the valuation is as tabulated below:

Number of Eligible Employees	808,844
Total Monthly Eligible Salary	Rs. 5,535,662,451

Analysis of the data revealed that the average past service of the employees was not increasing with age as expected. The source of the problem was the Lahore district data. Therefore two different distributions for the average past service with respect to age were used for valuation purposes. These include:

Past Service Distribution I

This distribution is determined based on the combined data (after normalization) available for various districts of the Punjab **including Lahore district**.

Past Service Distribution II

This distribution is determined based on the combined data (after normalization) available for districts of Punjab **other than Lahore district**. This past service distribution appears to be in line with the perceived hiring pattern of Punjab Government in the past.

Past Service Distribution III

This distribution constitutes data from Lahore district only (after normalisation).

The following table shows a comparison of the past service at each age for each type of past service distributions:

Age	Past Service Distribution			% difference between II and III	Age	Past Service Distribution			% difference between II and III
	I	II	III			I	II	III	
20	1.2	1.1	1.3	-18.2%	41	16.2	18.0	13.0	27.8%
21	1.5	1.6	1.5	6.3%	42	16.3	18.7	12.6	32.6%
22	1.7	2.0	1.6	20.0%	43	16.8	19.7	12.0	39.1%
23	2.2	2.6	2.0	23.1%	44	16.5	20.5	9.9	51.7%
24	2.4	2.0	2.4	-20.0%	45	17.5	21.1	12.6	40.3%
25	2.8	3.0	2.8	6.7%	46	18.1	21.7	12.9	40.6%
26	3.4	3.6	3.3	8.3%	47	18.2	22.2	12.9	41.9%
27	4.5	5.4	4.2	22.2%	48	18.3	22.8	12.4	45.6%
28	5.2	5.9	5.0	15.3%	49	18.6	23.4	12.9	44.9%
29	6.5	6.9	6.3	8.7%	50	19.1	24.3	13.6	44.0%
30	7.4	7.6	7.1	6.6%	51	20.0	25.2	13.7	45.6%
31	8.2	8.5	8.2	3.5%	52	20.6	25.7	14.4	44.0%
32	8.9	9.2	8.6	6.5%	53	20.6	26.4	14.4	45.5%
33	10.2	10.4	10.0	3.8%	54	21.1	26.8	14.4	46.3%
34	11.0	11.8	10.5	11.0%	55	21.2	27.5	14.3	48.0%
35	11.5	12.2	10.6	13.1%	56	22.0	28.7	15.0	47.7%
36	13.1	13.3	13.1	1.5%	57	22.8	28.9	16.3	43.6%
37	14.0	14.3	13.2	7.7%	58	22.6	29.8	16.3	45.3%
38	14.7	15.4	13.0	15.6%	59	23.7	30.0	15.8	47.3%
39	15.0	16.4	12.8	22.0%	60	22.9	29.8	17.1	42.6%
40	15.8	17.2	12.8	25.6%					

As can be seen, the average past services of Lahore district are significantly lower when compared to data from all districts excluding Lahore district, with the differential ranging between 40-50% for all ages between 45-60 years.

ii. Pensioners

Data related to pensioners was collected from three different sources as explained in detail in earlier part of the report. This included:

1. Pension payouts for 11 months from July 2006 to May 2007 totalling to Rs. 9.756 billion
2. Number of pensioners and their movement from January 2005 to June 2006
3. Details of current pensioners for Lahore district

The information related to number of pensioners as at 30th June 2006 and their movement since January 2005 was extrapolated to estimate the number

of pensioners as at 30th June 2007, assuming that the pensioners increased in the same proportion as in the past. Thus the total number of pensioners as at 30th June 2007 was estimated to be 414,734.

After removing the anomalies (as stated in the last section of the Report), the distributions of the remaining 26,084 Lahore district pensioners were applied on the estimated 414,734 pensioners of the Punjab province, assuming the sample to be a good representative of the total pensioners of the Punjab province.

The starting monthly pensions of the Lahore district pensioners were indexed accordingly to come up with their current monthly pensions. This was incorporated into the distributions of the estimated Punjab province pensioners. The summary of the final data used for valuation purposes is tabulated below:

	% Distribution			Avg. Monthly Pensions with Indexation (Rs.)		
	Family	Early	Normal	Family	Early	Normal
33-40	1%	0%	0%	402	-	-
41-50	11%	8%	0%	677	1,021	-
51-60	19%	42%	0%	1,265	1,417	-
61-70	31%	37%	58%	1,483	1,944	3,302
71-80	28%	11%	36%	1,722	2,218	2,919
81-90	10%	1%	6%	2,013	3,815	2,733

2.2 Valuation Assumptions

Actuarial Assumptions are an enterprise's best estimates of the variables that will determine the cost of providing post-employment benefits. Actuarial Assumptions generally comprise of financial assumptions and demographic assumptions.

Financial assumptions about future economic variables have an effect on the real value of money. The key components, for an actuarial valuation conducted to determine the financial implication to fund a Pension scheme, are:

- Net Rate of Return on the Fund
- Expected Increase in Eligible Salary
- Expected Increase in Pension
- Expenses of Management of Pension Scheme/Fund

Demographic assumptions about future characteristics of current and former employees (and their dependants) who are eligible for benefits. The key components of demographic assumptions are:

- Mortality assumptions
- Employee turnover, disability and early retirement assumptions

For the purposes of the actuarial valuation of Punjab Government pension Scheme, the following assumptions have been used:

i. Net Rate of Return on the Pension Fund

The investment instruments, available for the investment of employee benefit funds as at the valuation date, were generally yielding 9% – 12% per annum.

Taking into account the volatility of economic environment prevailing as at June 30, 2007, it had been assumed that the average long term net rate of return on the proposed Fund (inclusive of both the invested and the un-invested portions) will be 10% per annum (compounded).

ii. Expected Increase in Eligible (Pensionable) Salary

An estimate of future salary increases takes account of inflation, seniority, promotion and other relevant factors, such as supply and demand in the employment market. It had been assumed that salaries would increase at 9% per annum in future.

The net rate of return on the Fund and the rate of increase in the Eligible Salary are usually inter-related since during periods of inflation, both tend to rise in conformity with each other. From an actuarial costing point of view, it is the difference between these two rates that matters, and not their individual values in isolation.

Thus a difference of 1% between the long-term rate of return on the proposed Fund assets (i.e. 10%) and the long-term rate of increase in Eligible Salary (i.e. 9%) had been considered appropriate. Such an assumption was within the internationally and locally recognised norms.

iii. Pension Indexation

The indexation of pension has been assumed as the rate of 6% per annum. This was based upon past history of indexation provided by the government from time to time and future expectations based upon increased inflation expectation. (The average indexation given to pensioners since 1973 has been 6.8%)

iv. Expenses of Management

It had been assumed that the expenses for management of Pension Scheme/Fund would be borne by Punjab Government, and the valuation accordingly did not make any provision for them.

v. Expected Mortality Experience

It had been assumed that the mortality of the employees in active service will be according to EFU (61-66) Mortality Table. (Mortality Table is given in Appendix-VIII of the Report).

The mortality of the pensioners, retiring other than on account of ill-health, had been assumed to correspond to the Mortality Table, EFU (61-66) with a set-back of five years from the actual age.

The mortality of the pensioners, retiring on account of ill-health, had been assumed to correspond to the Mortality Table, EFU (61-66) with a set-forward of three years from the actual age.

vi. Expected rates of Withdrawal/Ill-health/Retirement

The Employee Turnover, Disability and Early Retirement rates used in the valuation were based on the experience of public-sector employee benefit schemes in Pakistan in conjunction with the pensioners' information provided for the Lahore district. (The table showing these rates is given in Appendix-VIII of the Report)

2.3 Cash-flow Projection Assumptions

Cash-flow projections of future pension payouts are based on a number of assumptions, which include the following:

- Nature of group
- Benefit structure
- Expected Increase in Salary
- Pension Indexation
- Management Expenses
- Expected Mortality Experience
- Expected rates of Withdrawal/Ill-health/Retirement

i. Nature of Group

For cash-flow projections, a closed pension group has been assumed, that is, no new entrants will enter the group of current pensioners.

ii. Benefit Structure

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

Section 3

3.1 Actuarial Valuation Method

The basic purpose of an Actuarial Valuation is to project the likely level of the emerging liabilities under a Pension Scheme and to recommend a plan for contributions that will enable the Pension Fund to accumulate sufficient assets for meeting these liabilities. The solvency level of a Pension Fund is generally monitored on a regular basis, particularly if the economic parameters controlling the financial health of the Fund change over time.

The liabilities of a Pension Scheme are long term, consequently the funds required to meet these liabilities can be accumulated over a longer period. In assessing the adequacy of the contribution rate, it is necessary to make projections to determine the levels of the liabilities and the accumulating assets.

To assess the expected liabilities of the Pension Scheme of Punjab Government, the Projected Unit Credit Method has been used.

Projected Unit Credit Method

The Projected Unit Credit (PUC) method is considered as an appropriate actuarial technique to determine the post-employment benefits (such as pension schemes) for large (open) groups in which employees exist and enter on regular basis. This method determines the liabilities by projecting service/salaries of the employees and then discounting the relevant costs as at the valuation date. Past service cost is calculated by associating the portion of total liability attributable to the service rendered on a pro-rata basis. The regular annual cost (called normal cost) is the liability attributable to one year determined on similar lines.

In a Pension Fund, the required contribution by the employer is dependent upon the age and service profile of the employees. As the time of ultimate benefit payoff comes closer, these factors increase in proportion to each other.

The funding of a Pension Scheme is divided into Past Service Cost and Future Service Cost. The Past Service Cost can be met either by making one lump sum payment to the Scheme or by amortising them over a certain specified period (a fixed number of years or the future working lifetime of the employees). The Future Service Cost is met by way of contributions, as a percentage of pay, to the Scheme. For new employees becoming members of the Scheme, there is no Past Service Cost, and contribution rate is specified such that it is adequate to finance the future benefits payable to such employees.

Section 4

4.1 Valuation Results

The valuation results have been determined for three different sets of (age-wise) past service distributions.

The economic assumptions used for the following calculations are:

Table 1

Expected Rate of Return on the Fund (i.e. the interest rate used to discount the future liabilities)	10% per annum
Expected Increase in Pensionable Pay	9% per annum
Expected Rate of Pension Indexation	6% per annum

Past Service Distribution I

This distribution is determined based on the combined data (after normalization) available for seven different districts of the Punjab. (However, as stated earlier, the past service distribution of Lahore district employees deviates significantly as compared to the similar information of other districts.)

The valuation results based on the above distribution is as follows:

Table 2

	Valuation Result (Rs. billion)
Accrued Liability on account of :	
a) Active Employees	296.151
b) Pensioners	128.714
Total Liability as at 30.06.2007	424.865
Required Contribution Rate, as %age of Eligible Salaries, to fund <i>Future Accrual</i> of Benefits	29.3%
Projected Liability as at	
30.06.2008	474.005
30.06.2009	523.368
30.06.2010	576.700
30.06.2011	636.482
30.06.2012	701.066

Past Service Distribution II

This distribution is determined based on the combined data (after normalization) available for districts of Punjab **other than Lahore district**. This past service distribution appears to be in line with the perceived hiring pattern of Punjab Government in the past.

The valuation results based on the above distribution is as follows:

Table 3

	Valuation Result (Rs. billion)
Accrued Liability on account of :	
a) Active Employees	355.839
b) Pensioners	128.714
Total Liability as at 30.06.2007	484.553
Required Contribution Rate, as %age of Eligible Salaries, to fund <i>Future Accrual</i> of Benefits	28.9%
Projected Liability as at	
30.06.2008	539.363
30.06.2009	595.248
30.06.2010	655.752
30.06.2011	723.421
30.06.2012	796.680

Past Service Distribution III

This distribution is determined based on the data (after normalization) only from the Lahore district data.

The valuation results based on the above distribution is as follows:

Table 4

	Valuation Result (Rs. billion)
Accrued Liability on account of :	
a) Active Employees	220.178
b) Pensioners	128.714
Total Liability as at 30.06.2007	348.892
Required Contribution Rate, as %age of Eligible Salaries, to fund <i>Future Accrual</i> of Benefits	28.7%
Projected Liability as at	
30.06.2008	389.987
30.06.2009	430.926
30.06.2010	474.991
30.06.2011	524.575
30.06.2012	577.940

4.2 Cash-Flow Projections

The expected pension payments split by regular pension and commutation over the next 50 years under Punjab Government Pension Scheme have been estimated on a combined basis for both active employees in conjunction with existing pensioners.

Past Service Distribution I

The expected pension out-flows under Distribution-I are as follows:

Table 5

Year	Payments (Rs. Billion)			Year	Payments (Rs. Billion)		
	Pension	Commutation	Total		Pension	Commutation	Total
2008	10.429	4.738	15.167	2033	99.209	15.865	115.074
2009	11.141	4.652	15.793	2034	104.531	14.205	118.736
2010	12.063	5.473	17.536	2035	109.238	12.527	121.765
2011	12.944	5.573	18.517	2036	113.874	12.014	125.888
2012	14.022	6.757	20.779	2037	118.636	10.685	129.321
2013	15.354	7.651	23.005	2038	123.193	10.29	133.483
2014	16.697	8.706	25.403	2039	127.759	10.078	137.837
2015	18.092	9.742	27.834	2040	132.202	11.218	143.42
2016	20.162	11.441	31.603	2041	136.496	9.696	146.192
2017	21.869	11.564	33.433	2042	140.696	10.1	150.796
2018	23.774	13.344	37.118	2043	144.299	9.099	153.398
2019	26.487	14.184	40.671	2044	147.562	6.774	154.336
2020	29.208	16.807	46.015	2045	150.336	5.028	155.364
2021	31.942	17.126	49.068	2046	152.604	3.297	155.901
2022	36.097	21.218	57.315	2047	154.305	1.636	155.941
2023	40.22	23.313	63.533	2048	155.479	0	155.479
2024	44.83	25.202	70.032	2049	156.334	0	156.334
2025	50.707	28.352	79.059	2050	156.844	0	156.844
2026	56.381	28.459	84.84	2051	157.041	0	157.041
2027	62.53	29.99	92.52	2052	156.651	0	156.651
2028	69.536	30.975	100.511	2053	155.587	0	155.587
2029	76.262	29.291	105.553	2054	154.482	0	154.482
2030	82.728	26.527	109.255	2055	152.931	0	152.931
2031	88.65	19.811	108.461	2056	151.299	0	151.299
2032	94.134	18.939	113.073	2057	149.493	0	149.493

Past Service Distribution II

The expected pension payments for Distribution-II are as follows:

Table 6

Year	Payments (Rs. Billion)			Year	Payments (Rs. Billion)		
	Pension	Commutation	Total		Pension	Commutation	Total
2008	10.667	5.737	16.404	2033	101.875	15.867	117.742
2009	11.526	5.621	17.147	2034	107.218	14.205	121.423
2010	12.592	6.371	18.963	2035	111.936	12.526	124.462
2011	13.616	6.425	20.041	2036	116.571	12.014	128.585
2012	14.861	7.717	22.578	2037	121.319	10.685	132.004
2013	16.352	8.499	24.851	2038	125.855	10.29	136.145
2014	17.855	9.509	27.364	2039	130.393	10.078	140.471
2015	19.386	10.33	29.716	2040	134.801	11.218	146.019
2016	21.588	11.951	33.539	2041	139.054	9.696	148.75
2017	23.423	11.999	35.422	2042	143.208	10.1	153.308
2018	25.436	13.604	39.04	2043	146.761	9.099	155.86
2019	28.234	14.262	42.496	2044	149.971	6.774	156.745
2020	31.038	16.843	47.881	2045	152.7	5.028	157.728
2021	33.85	17.145	50.995	2046	154.934	3.297	158.231
2022	38.084	21.229	59.313	2047	156.613	1.636	158.249
2023	42.285	23.325	65.61	2048	157.778	0	157.778
2024	46.972	25.216	72.188	2049	158.635	0	158.635
2025	52.924	28.362	81.286	2050	159.163	0	159.163
2026	58.671	28.467	87.138	2051	159.391	0	159.391
2027	64.891	30.001	94.892	2052	158.937	0	158.937
2028	71.963	30.985	102.948	2053	157.769	0	157.769
2029	78.75	29.299	108.049	2054	156.573	0	156.573
2030	85.271	26.534	111.805	2055	154.948	0	154.948
2031	91.243	19.817	111.06	2056	153.255	0	153.255
2032	96.767	18.942	115.709	2057	151.366	0	151.366

Past Service Distribution III

The expected pension payments for Distribution-III are as follows:

Table 7

Year	Payments (Rs. Billion)			Year	Payments (Rs. Billion)		
	Pension	Commutation	Total		Pension	Commutation	Total
2008	10.332	3.309	13.641	2033	90.623	15.865	106.488
2009	10.791	3.486	14.277	2034	95.771	14.204	109.975
2010	11.495	4.137	15.632	2035	100.329	12.527	112.856
2011	12.155	4.174	16.329	2036	104.844	12.014	116.858
2012	12.928	5.105	18.033	2037	109.515	10.685	120.200
2013	13.943	5.892	19.835	2038	114.012	10.290	124.302
2014	14.959	6.870	21.829	2039	118.545	10.078	128.623
2015	15.971	7.769	23.740	2040	122.985	11.218	134.203
2016	17.552	9.142	26.694	2041	127.308	9.696	137.004
2017	18.844	9.524	28.368	2042	131.569	10.100	141.669
2018	20.267	10.979	31.246	2043	135.262	9.099	144.361
2019	22.468	11.781	34.249	2044	138.644	6.774	145.418
2020	24.690	14.634	39.324	2045	141.556	5.028	146.584
2021	26.974	15.437	42.411	2046	143.965	3.297	147.262
2022	30.671	19.606	50.277	2047	145.810	1.636	147.446
2023	34.145	20.568	54.713	2048	147.128	0.000	147.128
2024	38.391	24.475	62.866	2049	148.116	0.000	148.116
2025	44.009	28.338	72.347	2050	148.740	0.000	148.740
2026	49.424	28.454	77.878	2051	149.026	0.000	149.026
2027	55.317	29.986	85.303	2052	148.786	0.000	148.786
2028	62.069	30.972	93.041	2053	147.978	0.000	147.978
2029	68.547	29.288	97.835	2054	147.024	0.000	147.024
2030	74.774	26.524	101.298	2055	145.620	0.000	145.620
2031	80.470	19.809	100.279	2056	144.108	0.000	144.108
2032	85.741	18.937	104.678	2057	142.427	0.000	142.427

4.3 Sensitivity Analysis

In order to gauge the potential variation in the pension benefit liabilities of the Punjab Government, actuarial valuation has been conducted (for Past Service Distribution-1 only) by changing some critical economic and demographic assumptions/characteristics. The various set of assumptions and their associated pension liabilities are given below:

Table 8

Scenarios	Assumptions		
	Expected Rate of Return	Expected Increase in Pensionable Pay	Expected Rate of Pension Indexation
Base Scenario	10%	9%	6%
Sensitivity-I	10%	9%	5%
Sensitivity-II	10%	9%	4%
Sensitivity-III	10%	10%	6%
Sensitivity-IV	10%	8%	6%
Sensitivity-V	Valuation Results based on active employees' distribution with average age = average age - 1 year past service = past service - 1 year		
Sensitivity-VI	Valuation Results based on active employees' distribution with average age = average age + 1 year past service = past service + 1 year		

Table 9

	Sensitivity-I Result (Rs. billion)	Sensitivity-II Result (Rs. billion)	Sensitivity-III Results (Rs. billion)
Accrued Liability on account of :			
a) Active Employees	276.560	260.093	327.271
b) Pensioners	117.998	108.801	128.714
Total Liability as at 30.06.2007	394.558	368.894	455.985
Percentage Increase/(Decrease) in Liability from Base Scenario	(7.1%)	(13.2%)	7.3%
Required Contribution Rate, as %age of Eligible Salaries, to fund Future Accrual of Benefits	27.4%	25.7%	32.3%
Percentage Increase/(Decrease) in Required Contribution Rate from Base Scenario	(6.7%)	(12.3%)	9.9%

	Sensitivity-IV Result (Rs. billion)	Sensitivity-V Result (Rs. billion)	Sensitivity-VI Results (Rs. billion)
Accrued Liability on account of :			
a) Active Employees	268.930	274.918	317.713
b) Pensioners	128.714	128.714	128.714
Total Liability as at 30.06.2007	397.644	403.632	446.427
Percentage Increase/(Decrease) in Liability from Base Scenario	(6.4%)	(5.0%)	5.1%
Required Contribution Rate, as %age of Eligible Salaries, to fund <i>Future Accrual</i> of Benefits	26.8%	28.6%	30.0%
Percentage Increase/(Decrease) in Required Contribution Rate from Base Scenario	(8.6%)	(2.5%)	2.1%

4.4 Summary Table

The following table summarises the effect of various sensitivities on accrued pension liability:

Sensitivity	Accrued Liability as at 30.06.2007 (Rs. billion)	Increase in Liability compared to Base – Past Service Distribution I
Base – Past Service Distribution I	424.9	0 %
Base – Past Service Distribution II	484.6	14.1%
Base – Past Service Distribution III	348.9	(17.9%)
Sensitivity – I	394.6	(7.1%)
Sensitivity – II	368.9	(13.2%)
Sensitivity – III	456.0	7.3%
Sensitivity – IV	397.6	(6.4%)
Sensitivity – V	403.6	(5.0%)
Sensitivity – VI	446.4	5.1%

4.5 Observations/Comments

1. The actuarial valuation of the Punjab Government Pension Scheme has been conducted as at 30.06.2007.
2. The valuation was performed on the population of active employees and pensioners which was extrapolated from the samples available as at the valuation date. The details of the samples and their extrapolation have been explained in earlier part of the Report.
3. The past service distribution of active employees of Lahore district deviates significantly from the similar information available for other districts of the Punjab.

Therefore, the actuarial valuation has been conducted for three different sets of active employees' past service distributions. The tables are provided in the Data Assumptions section of the report.

Past Service Distribution-1 is based on the combined data (after normalization) available for various districts of the Punjab (including Lahore district).

Past Service Distribution-2 is based on the combined data (after normalization) available for districts of Punjab **other than Lahore**. This past service distribution appears to be in line with the perceived hiring pattern of the Punjab Government in the past.

Past Service Distribution-3 is based on the data from Lahore district only (after normalisation).

The critical portion of the differences in past service under the above two distributions is associated with the services of employees with ages 50-60. Additionally, the difference in average past service for these employees is also significant as compared to other ages under the said distributions.

The maximum service allowed for pension benefits is 30 years. Therefore, employees below 50 years of age generally render maximum allowed service before normal retirement under the above two distributions. Thus, in view of the relatively smaller difference in average past service of the employees with age 20-49 under the two distributions and the applicability of the cap on pensionable service, the liability of the employees below age 50 do not differ significantly for the said distributions.

However, Past Service Distribution-1 has been considered as the base employee distribution for the valuation because it pertains to the total information available for the exercise.

4. The past service accrued liability of the Punjab Government Pension Scheme works out to approximately **Rs.425 billion** as at 30.06.2007 for Distribution-1(distribution including Lahore). Out of this amount, approximately 70% (Rs.296 billion) of the liability pertains to active employees. The contribution rate, as percentage of total pensionable salaries, required for funding the future accrual of benefits (or by which the amount of accrued liability, after taking into account the effect of interest, increases) is **29.3%**. The projected accrued liabilities for the next five years are also presented in the **Table 2** of results given in the previous section.
5. The past service accrued liability for Distribution-2 is **Rs.485 billion** as at 30.06.2007 (an increase of Rs.60 billion compared to Past Service Distribution I). This is due to Lahore district having significantly lower past service pattern compared to other districts. The contribution rate required to fund future accrual of benefits works out to **28.9%** of total pensionable salaries.
6. The past service accrued liability for Distribution-3 is **Rs.349 million** as at 30.06.2007 (a decrease of Rs.76 billion compared to Past Service Distribution I). This is again due to Lahore district having significantly lower past service pattern compared to other districts. The contribution rate required to fund future accrual of benefits works out to **28.7%** of total pensionable salaries.
7. The projected accrued liabilities for the next five years are provided in the **Table 2, Table 3 and Table 4** of results given in the previous section. As an example, the basic liability of Rs.425 billion as at 30.06.2007 would increase to Rs.577 billion in 3 years time.
8. As per the very approximate actuarial exercise done in 2003, the estimated liability of the Punjab Government Pension Scheme and the future required contribution rate provided as at 30.06.2003 was as follows:

	(Rs. billion)
Accrued Liability on account of :	
a) Active Employees	124.157
b) Pensioners	67.513
Total Liability as at 30.06.2003	191.670
Required Contribution Rate, as %age of Eligible Salaries, to fund Future Accrual of Benefits	17.5%

Total accrued liability as at 30.06.2003 was estimated to be **Rs.192 billion**.

In case the above valuation results were projected to estimate the liability as 30.06.2007, the resulting would have been approximately **Rs.325 billion**, which is Rs.100 billion less than the liability calculated in the current exercise.

Major reasons for the major differences in the results obtained in the year 2003 and 2007 are as follows:

- The employee distributions used as at 30.06.2003 was determined from Pakistan Railways' employees and pensioners data whereas the liability as at 30.06.2007 is based on the samples from Punjab Government population.
- The increase in average pensionable salary from 2003 to 2007 reflects 12%-15% per annum against the assumption of 8% annual increase.
- The actuarial valuation as at 30.06.2003 assumed an increase in monthly pensions at the rate of 4% per annum whereas liabilities as at 30.06.2007 are based on 6% annual increase in pensions. The basis of this assumption is explained in the Assumptions section of the report.

Similar reasons are true for the increase in the required contribution rate from 17.5% (as at 30.06.2003) to 29.3% of pensionable salaries (as at 30.06.2007).

9. The Pension benefit cash out-flows have been projected for the next 50 years under both distributions. The amounts of annual pension, commutation and total payments for each year have been provided in the relevant table given in the previous section of the report. The cash-flow projections under both distributions reveal that the amount of commutation increases for the next 21 years and then start decreasing. The total amount of pension payments declines after 45 years from 2007. The expected cash-flows build up rapidly over the next 20-25 years. In year 2015, the expected cash-flow is Rs.28 billion, which escalates to Rs.46 billion, Rs.79 billion and Rs.109 billion in years 2020, 2025 and 2030 respectively.
10. There are no visible jumps in expected cash-flows in any year and the amounts have a rather smooth progression over time.
11. In order to determine the extent of potential deviation in the past service accrued liability and required contribution rate on account of variation in valuation assumption, various sensitivity test have been conducted as at 30.06.2007 for only the base distribution. The results under Sensitivity-I are based on the change in assumption of future pension indexation from 6% to 5% per annum. Sensitivity-II assumes 4% pension indexation per annum in future. Sensitivity-III and IV provides results under 10% and 8% annual rate of salary increases in future respectively (compared to 9% per annum base assumption). The figures under Sensitivity-V and VI represent valuation results by decreasing and increase 1 year from average age/past service of employees. The sensitivity tests reveal that the accrued liability (of **Rs.425 billion** under base scenario) varies from **Rs.369 billion** to **Rs.456 billion**. (This represents a percent change in liability from -13.2% to +7.3%). The

contribution rate required to fund future accrual of benefits (29.3% under the base scenario) varies from 25.7% to 32.3% of pensionable salaries. (The percentage change in contribution rate ranges from -12.3% to +9.9%).

12. **Although various data, economic and demographic assumptions lead to varying estimates of pension liabilities, it is safely stated that the MINIMUM expected liability aggregate for Punjab Government Pension Scheme (for actives and pensioners combined) is Rs.349 billion as at 30th June 2007.**

Section 5

5.1 Funding Requirements

In view of the rapid increase in annual pension benefit payments, the Punjab Government has setup a Pension Fund so that pension payments can be financed directly from the Fund and the burden on provincial budget can be reduced.

The funding of the Pension Fund is to be made through budgetary allocations. The Punjab Pension Fund Act, 2007 was officially enacted (after approval from the Provincial Legislature) on March 7, 2007.

The investments of the Pension Fund are to be made by the Management Committee according to the requirements of the Act. The Punjab Government has allocated **Rs.8 billion** (Rs.2 billion during 2005-06 and Rs.6 billion during 2006-07) in the Reserve Fund of the Pension Fund. The Reserve Fund is a part of the Public Account of the Province.

The Government has a plan to capitalize the Pension Fund with **Rs.100 billion** by the end of year 2016. It believes that once the Fund is established and capitalized at the above level, the pension payments (regular and commutation) will be made through the investment income of the Fund only and consequently pension will be made an off-budget item for the Province.

Keeping in view the actuarial valuation and cash-flow projections results as at 30.06.2007, the above funding strategy appears to be grossly inadequate. This can be seen from the following table which compares the investment income expected from the targeted Fund of Rs.100 billion (assuming annual return of 10% on the Fund) and the expected pension outgo:

Year	Investment Income expected from the Pension Fund (Rs. billion)	Expected Pension Outgo (Rs. billion)	Shortfall in Income to cover Expense (Rs. billion)	Investment Income as a % of expected Pension expense
2016	10	32	(22)	31%
2020	10	46	(36)	22%
2025	10	79	(69)	13%
2030	10	109	(99)	9%
2035	10	122	(112)	8%
2040	10	143	(133)	7%

If it is intended by the Government that the Investment Income from the Pension Fund should cover a significant portion of pension outgoes from 2016 onwards, the Government will need to significantly enhance its funding target by the year 2016. The Fund requirement in 2016 to cover full expected pension outgoes for the next 10 years is Rs.465 billion. This amount increases to Rs.565 billion if outgoes over 15 years are to be met.

In other words, the Government will be able to cover only 22% of cash-flows over the next 10 years after year 2016 if the target amount remains at Rs.100 billion (this reduces to 18% if the time horizon is increased to 15 years).

In view of the above, it is recommended that the Government should target to accumulate at least Rs.350 billion in the Pension Fund by year 2016. In such case, it can expect to cover a substantial portion of 75% of cash-flows over the next 10 years (or 62% if the time period is increased to 15 years).

The Government should also consider continuing making additional contributions after year 2016 so that the Fund size continues to build up to meet meaningful portion of future pension outgoes.

Section 6

6.1 Comprehensive Actuarial Analysis

In view of the non-availability of information about total number of Pensionable employees of the Punjab Govt. and considering the extent of errors in PIFRA database, it is extremely important that a more comprehensive actuarial analysis is carried out to estimate Punjab Govt. Pension liabilities once the project of Civil Service Census is complete (or is near completion).

The Terms of Reference for this exercise should be on the following lines:

- i. Perform data checks to verify accuracy of information and make appropriate adjustments
- ii. Verify accuracy and appropriateness various key assumptions.
- iii. Calculate the accrued Pension Scheme liability as of the latest date.
- iv. Perform pension related cash flow projections over the next 15-20 years.
- v. Carry out sensitivity tests of key assumptions
- vi. Recommend funding strategy for the Punjab Pension Fund based upon the results.

It is expected that the elapsed timeframe for the above exercise will be 5-6 months. The elapsed period will be heavily dependent on the speed at which relevant information can be acquired.

Importantly, it would be advisable to have another actuarial exercise done before completion of Civil Service Census and after 70-80% of the data has been fed onto the PIFRA System (which is expected to be done in the next 5-6 months) because it is important have a more credible idea of the past service distribution as this can impact the liability heavily (as discussed earlier in the report).

Section 7

7.1 Conclusions

- a. Based upon the information available, the accrued pension liability of Punjab Govt. Pension Scheme is Rs.425 billion as at 30.06.2007
- b. This liability figure is based upon the combined distribution of 7 districts including Lahore district. Lahore has a significantly different distribution than other districts. In case, it is assumed that Punjab Govt. employees will have past service pattern in line with districts other than Lahore, the liability as at 30.06.2007 jumps by Rs.60 billion to Rs.485 billion. However, this estimate reduces to Rs.349 billion if it is assumed that all districts will have the same past service distribution as Lahore.
- c. The cash outflows related to pension liabilities are expected to build up rapidly over the next 20 years or so. They achieve a high figure of Rs.46 billion in 2020 and escalate to Rs.109 billion in 2030.
- d. In view of the huge quantum of increasing cash outgoes the Govt. needs to significantly increase its target of having Rs.100 billion in the Pension Fund in the next few years. At this level, investment income will cover a relatively small percentage of cash out flows.

It is recommended that the target amount in the Pension Fund be increased to a minimum of Rs.350 billion.

- e. In view of lack of knowledge about number of employees in the Punjab Govt. and the extent of errors in PIFRA database, it would be important to carry out a more comprehensive exercise when the project of Civil Service Census is completed.

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Appendix I

Summary of Lahore District Data (Source GoPb)

Age-wise Distribution

Age	Total Number	Total Monthly Salary	Avg. Monthly Salary	Avg. PS	Distribution	Smoothed Distribution
20	355	1,015,800	2,861	1.3	0.4%	0.4%
21	666	1,925,670	2,891	1.5	0.8%	0.8%
22	892	2,615,850	2,933	1.6	1.0%	1.1%
23	8714	2,883,000	3,000	2.0	9.9%	1.2%
24	1486	4,556,085	3,066	2.4	1.7%	1.2%
25	1609	5,026,825	3,124	2.8	1.8%	2.0%
26	1532	4,911,810	3,206	3.3	1.7%	1.9%
27	1439	4,851,215	3,371	4.2	1.6%	1.8%
28	1388	4,998,950	3,602	5.0	1.6%	1.7%
29	1388	5,288,595	3,810	6.3	1.6%	1.7%
30	1335	5,327,395	3,991	7.1	1.5%	1.7%
31	1601	6,618,825	4,134	8.2	1.8%	2.0%
32	1568	6,803,985	4,339	8.6	1.8%	2.0%
33	1811	8,347,350	4,609	10.0	2.1%	2.3%
34	1789	8,676,445	4,850	10.5	2.0%	2.2%
35	2176	11,304,741	5,195	10.6	2.5%	2.7%
36	2226	12,298,622	5,525	13.1	2.5%	2.8%
37	2653	15,120,603	5,699	13.2	3.0%	3.3%
38	3136	18,742,995	5,977	13.0	3.6%	3.9%
39	3769	23,506,128	6,237	12.8	4.3%	4.7%
40	3474	22,105,130	6,363	12.8	4.0%	4.3%
41	3668	24,019,670	6,548	13.0	4.2%	4.6%
42	3865	26,619,275	6,887	12.6	4.4%	4.8%
43	3472	24,281,500	6,994	12.0	4.0%	4.3%
44	3310	24,668,960	7,453	9.9	3.8%	4.1%
45	3246	25,551,755	7,872	12.6	3.7%	4.1%
46	2536	20,968,834	8,268	12.9	2.9%	3.2%
47	2732	23,340,464	8,543	12.9	3.1%	3.4%
48	2298	20,761,635	9,035	12.4	2.6%	2.9%
49	2440	22,014,665	9,022	12.9	2.8%	3.0%
50	2127	20,282,710	9,536	13.6	2.4%	2.7%
51	2180	21,217,385	9,733	13.7	2.5%	2.7%
52	1833	18,298,395	9,983	14.4	2.1%	2.3%
53	1794	18,749,845	10,451	14.4	2.0%	2.2%
54	1469	16,092,350	10,955	14.4	1.7%	1.8%
55	1401	15,628,585	11,155	14.3	1.6%	1.7%
56	1056	12,542,590	11,877	15.0	1.2%	1.3%
57	1038	13,124,825	12,644	16.3	1.2%	1.3%
58	912	13,224,735	14,501	16.3	1.0%	1.1%
59	864	12,666,920	14,661	15.8	1.0%	1.1%
60	570	8,321,255	14,599	17.1	0.6%	0.7%

Grade-wise Distribution

Grade	Number in Grade	Total Monthly Salary	Avg. Monthly Salary	Avg. AGE	PS	Distribution
1	13,627	51,753,780	3,798	39	10	15.5%
2	3,393	28,515,682	8,404	44	10	3.9%
3	1,057	6,759,675	6,395	41	11	1.2%
4	916	3,950,050	4,312	43	9	1.0%
5	27,742	115,239,225	4,154	33	9	31.5%
6	2,013	16,595,825	8,244	41	10	2.3%
7	10,606	45,857,540	4,324	40	12	12.1%
8	745	24,264,159	32,569	43	13	0.8%
9	4,968	17,383,461	3,499	40	11	5.6%
10	1,915	18,602,670	9,714	49	10	2.2%
11	2,722	31,775,410	11,674	44	11	3.1%
12	1,073	7,188,450	6,699	44	11	1.2%
13	142	5,997,090	42,233	46	11	0.2%
14	3,571	14,293,925	4,003	40	11	4.1%
15	1,582	27,648,975	17,477	46	11	1.8%
16	3,953	27,552,270	6,970	46	12	4.5%
17	4,276	74,558,100	17,436	46	13	4.9%
18	2,358	63,235,715	26,818	48	15	2.7%
19	1,025	31,556,415	30,787	52	16	1.2%
20	229	10,951,740	47,824	54	20	0.3%
21	37	1,837,825	49,671	54	18	0.0%
22	7	312,060	44,580	59	15	0.0%
23	31	2,954,500	95,306	56	6	0.0%

Summary of Lahore District Data (Source Federal Government)
Age-wise Distribution

Age	Total Number	Total Monthly Salary	Avg. Monthly Salary	Avg. PS	Distribution
20	332	860,528	2,592	1.4	0.4%
21	554	1,429,492	2,580	1.6	0.6%
22	751	1,972,793	2,627	1.8	0.9%
23	9045	50,315,014	5,563	3.9	10.5%
24	1342	3,737,988	2,785	2.6	1.6%
25	1439	4,090,679	2,843	3.0	1.7%
26	1387	4,048,234	2,919	3.5	1.6%
27	1386	4,239,653	3,059	4.3	1.6%
28	1367	4,427,367	3,239	5.1	1.6%
29	1369	4,728,952	3,454	6.4	1.6%
30	1306	4,746,687	3,635	7.2	1.5%
31	1585	5,893,830	3,719	8.3	1.8%
32	1538	5,990,028	3,895	8.6	1.8%
33	1796	7,384,805	4,112	10.1	2.1%
34	1753	7,495,477	4,276	10.5	2.0%
35	2158	9,936,128	4,604	10.6	2.5%
36	2224	10,887,055	4,895	13.2	2.6%
37	2601	12,998,924	4,998	13.3	3.0%
38	3088	16,198,694	5,246	12.9	3.6%
39	3697	20,287,416	5,488	12.7	4.3%
40	3411	19,078,675	5,593	12.6	4.0%
41	3606	20,664,229	5,731	12.8	4.2%
42	3804	23,042,138	6,057	12.4	4.4%
43	3412	20,935,362	6,136	11.7	4.0%
44	3237	21,175,061	6,542	11.1	3.8%
45	3154	21,629,360	6,858	12.1	3.7%
46	2459	17,832,216	7,252	12.4	2.9%
47	2649	19,842,117	7,490	12.4	3.1%
48	2237	17,776,593	7,947	11.9	2.6%
49	2368	18,704,364	7,899	12.4	2.8%
50	2082	17,394,900	8,355	13.0	2.4%
51	2129	18,120,012	8,511	13.2	2.5%
52	1799	15,674,477	8,713	13.9	2.1%
53	1796	16,442,009	9,155	14.0	2.1%
54	1443	13,773,525	9,545	13.9	1.7%
55	1375	13,410,623	9,753	14.0	1.6%
56	1024	10,569,388	10,322	14.1	1.2%
57	1017	11,268,260	11,080	15.7	1.2%
58	883	11,174,854	12,656	15.8	1.0%
59	830	10,535,961	12,694	15.2	1.0%
60	643	8,418,605	13,093	15.9	0.7%

Grade-wise Distribution

Grade	Total Monthly Salary	Total Number	Avg. Monthly Salary	Avg. Age	Avg. PS	Distribution
1	112,142,995	33680	3,330	40	14	17.9%
2	26,992,429	7043	3,833	44	16	3.7%
3	6,725,035	1824	3,687	40	12	1.0%
4	6,491,010	1648	3,939	42	13	0.9%
5	178,897,500	44430	4,027	34	11	23.6%
6	21,788,899	4487	4,856	41	14	2.4%
7	135,949,708	25872	5,255	41	16	13.8%
8	7,494,845	1364	5,495	43	16	0.7%
9	77,377,039	13640	5,673	40	15	7.3%
10	58,992,557	8514	6,929	49	22	4.5%
11	31,885,076	4653	6,853	45	16	2.5%
12	25,321,544	3354	7,550	46	19	1.8%
13	1,966,020	266	7,391	45	15	0.1%
14	86,837,284	11789	7,366	40	15	6.3%
15	32,594,590	3501	9,310	46	17	1.9%
16	79,894,464	7936	10,067	45	17	4.2%
17	117,347,208	8218	14,279	46	16	4.4%
18	75,333,716	3857	19,532	48	18	2.1%
19	38,679,706	1625	23,803	52	20	0.9%
20	8,844,184	303	29,189	53	22	0.2%
21	1,092,452	31	35,240	54	21	0.0%
22	293,935	7	41,991	59	18	0.0%
23	2,954,500	31	95,306	57	7	0.0%

**Summary of Rawalpindi District Data
Age-wise Distribution**

Age	Total Number	Avg. Monthly Salary	Avg. PS	Distribution	Smoothed Distribution
20	38	2,368	0.7	0.1%	0.1%
21	65	2,565	1.3	0.2%	0.2%
22	178	2,524	1.8	0.6%	0.7%
23	240	2,578	2.3	0.8%	0.9%
24	334	2,668	2.6	1.1%	1.2%
25	394	2,725	2.9	1.3%	1.5%
26	423	2,814	3.4	1.4%	1.6%
27	1880	4,979	6.3	6.2%	1.5%
28	424	3,210	5.1	1.4%	1.6%
29	393	3,396	6.2	1.3%	1.4%
30	550	3,879	7.7	1.8%	2.0%
31	446	3,623	7.4	1.5%	1.6%
32	509	4,028	9.3	1.7%	1.9%
33	503	4,345	10.0	1.7%	1.9%
34	2375	4,647	13.2	7.8%	2.0%
35	718	4,886	12.2	2.4%	2.6%
36	730	5,413	12.7	2.4%	2.7%
37	1551	5,908	15.2	5.1%	5.7%
38	1937	5,489	16.5	6.4%	7.1%
39	1658	5,651	17.3	5.4%	6.1%
40	2066	6,193	18.8	6.8%	7.6%
41	1603	6,094	19.4	5.3%	5.9%
42	1335	6,191	19.7	4.4%	4.9%
43	1351	6,414	20.8	4.4%	5.0%
44	1427	6,144	21.9	4.7%	5.3%
45	994	6,691	21.7	3.3%	3.7%
46	845	6,758	22.8	2.8%	3.1%
47	868	7,098	23.2	2.9%	3.2%
48	722	7,486	24.2	2.4%	2.7%
49	539	7,314	24.4	1.8%	2.0%
50	430	8,544	24.2	1.4%	1.6%
51	543	7,913	25.4	1.8%	2.0%
52	452	8,558	25.9	1.5%	1.7%
53	330	8,415	25.1	1.1%	1.2%
54	289	9,250	25.2	0.9%	1.1%
55	321	9,347	25.5	1.1%	1.2%
56	246	10,352	25.6	0.8%	0.9%
57	354	9,834	25.7	1.2%	1.3%
58	197	10,681	24.8	0.6%	0.7%
59	166	9,583	26.3	0.5%	0.6%
60	25	13,300	28.6	0.1%	0.1%

Grade-wise Distribution

Grade	Total Monthly Salary	Number in Grade	Avg. Monthly Salary	Avg. Age	Avg. PS	Distribution
1	17,637,492	5,455	3,233	38	15	17.9%
2	4,285,455	1,138	3,766	41	20	3.7%
3	669,175	199	3,363	35	14	0.7%
4	862,615	229	3,767	39	16	0.8%
5	24,912,535	6,436	3,871	34	12	21.1%
6	2,224,324	495	4,494	38	15	1.6%
7	23,225,522	4,492	5,170	40	18	14.8%
8	717,630	136	5,277	40	18	0.4%
9	12,989,555	2,409	5,392	39	16	7.9%
10	12,451,390	1,799	6,921	47	25	5.9%
11	3,797,146	555	6,842	44	22	1.8%
12	5,392,833	690	7,816	46	23	2.3%
13	216,020	35	6,172	37	14	0.1%
14	16,917,458	2,406	7,031	39	16	7.9%
15	5,668,927	633	8,956	43	21	2.1%
16	12,885,523	1,297	9,935	42	18	4.3%
17	17,445,722	1,274	13,694	42	15	4.2%
18	9,719,425	497	19,556	46	20	1.6%
19	6,084,731	254	23,956	50	23	0.8%
20	553,088	20	27,654	52	20	0.1%

**Summary of Sahiwal District Data
Age-wise Distribution**

Age	Total Number	Total Monthly Salary	Avg. Monthly Salary	Avg. PS	Distribution	Smoothed Distribution
20	6	13,525	2,254	1.3	0.0%	0.0%
21	5	11,525	2,305	1.0	0.0%	0.0%
22	0	-	-	0.0	0.0%	0.0%
23	2	5,130	2,565	0.5	0.0%	0.0%
24	2	4,430	2,215	1.5	0.0%	0.0%
25	8	24,585	3,073	2.6	0.0%	0.1%
26	6	15,285	2,548	3.3	0.0%	0.0%
27	1,276	6,180,289	4,843	7.0	7.6%	0.2%
28	57	157,210	2,758	7.2	0.3%	0.4%
29	87	285,002	3,276	7.8	0.5%	0.6%
30	95	330,815	3,482	8.9	0.6%	0.6%
31	155	602,615	3,888	9.3	0.9%	1.0%
32	194	804,890	4,149	9.8	1.2%	1.2%
33	289	1,175,730	4,068	10.8	1.7%	1.9%
34	334	1,470,710	4,403	11.3	2.0%	2.1%
35	451	2,132,765	4,729	11.9	2.7%	2.9%
36	537	2,614,765	4,869	12.8	3.2%	3.4%
37	704	3,476,975	4,939	13.4	4.2%	4.5%
38	785	4,035,734	5,141	14.6	4.7%	5.0%
39	901	4,722,348	5,241	15.8	5.4%	5.8%
40	838	4,593,730	5,482	16.6	5.0%	5.4%
41	920	5,116,814	5,562	17.2	5.5%	5.9%
42	997	5,684,587	5,702	18.1	5.9%	6.4%
43	884	5,087,885	5,756	19.1	5.2%	5.7%
44	825	4,855,557	5,886	19.7	4.9%	5.3%
45	733	4,621,609	6,305	20.5	4.4%	4.7%
46	598	3,804,337	6,362	20.9	3.6%	3.8%
47	597	3,825,532	6,408	21.2	3.5%	3.8%
48	523	3,422,974	6,545	22.1	3.1%	3.4%
49	562	3,721,387	6,622	23.0	3.3%	3.6%
50	496	3,570,608	7,199	23.4	2.9%	3.2%
51	490	3,656,279	7,462	24.8	2.9%	3.1%
52	447	3,467,479	7,757	25.2	2.7%	2.9%
53	390	3,028,513	7,765	26.4	2.3%	2.5%
54	373	3,183,900	8,536	26.6	2.2%	2.4%
55	308	2,530,915	8,217	27.6	1.8%	2.0%
56	245	2,187,675	8,929	28.1	1.5%	1.6%
57	221	1,952,710	8,836	28.9	1.3%	1.4%
58	153	1,462,314	9,558	29.4	0.9%	1.0%
59	207	1,914,575	9,249	30.1	1.2%	1.3%
60	139	1,431,649	10,300	30.9	0.8%	0.9%

Grade-wise Distribution

Grade	Total Monthly Salary	Number in Grade	Avg. Monthly Salary	Avg. Age	Avg. PS	Distribution
1	13,531,817	4,028	3,359	41	16	23.9%
2	2,498,830	649	3,850	45	21	3.9%
3	410,175	118	3,476	37	15	0.7%
4	535,960	134	4,000	42	17	0.8%
5	8,752,926	1,955	4,477	40	17	11.6%
6	2,559,590	519	4,932	42	19	3.1%
7	10,971,104	2,122	5,170	41	17	12.6%
8	630,066	115	5,479	43	20	0.7%
9	8,740,105	1,571	5,563	40	16	9.3%
10	8,635,315	1,248	6,919	49	25	7.4%
11	2,456,870	355	6,921	47	23	2.1%
12	3,198,528	408	7,840	47	24	2.4%
13	97,155	13	7,473	40	17	0.1%
14	11,063,202	1,568	7,056	40	15	9.3%
15	2,476,794	274	9,039	46	22	1.6%
16	6,870,733	706	9,732	44	19	4.2%
17	10,069,471	693	14,530	47	22	4.1%
18	4,564,387	233	19,590	50	23	1.4%
19	2,729,235	118	23,129	52	25	0.7%
20	393,094	13	30,238	56	32	0.1%

**Summary of Jhelum District Data
Age-wise Distribution**

Age	Total Number	Total Monthly Salary	Avg. Monthly Salary	Avg. PS	Distribution
20	33	77,450	2,347	1.0	0.3%
21	32	76,910	2,403	1.1	0.3%
22	34	85,419	2,512	1.7	0.3%
23	145	610,271	4,209	2.7	1.4%
24	59	156,449	2,652	2.6	0.6%
25	67	194,257	2,899	2.7	0.7%
26	60	165,233	2,754	2.8	0.6%
27	112	421,070	3,760	5.6	1.1%
28	68	204,780	3,011	4.7	0.7%
29	64	205,387	3,209	6.2	0.6%
30	86	311,670	3,624	7.2	0.8%
31	114	432,764	3,796	8.0	1.1%
32	116	451,661	3,894	9.0	1.1%
33	163	686,879	4,214	10.2	1.6%
34	190	827,678	4,356	11.5	1.9%
35	236	1,054,070	4,466	11.7	2.3%
36	288	1,366,495	4,745	12.5	2.8%
37	394	1,885,834	4,786	13.8	3.9%
38	454	2,413,164	5,315	14.8	4.4%
39	549	2,885,372	5,256	16.0	5.4%
40	559	3,049,684	5,456	17.0	5.5%
41	532	3,013,500	5,664	17.7	5.2%
42	669	3,813,873	5,701	18.6	6.6%
43	624	3,603,772	5,775	19.6	6.1%
44	559	3,309,658	5,921	20.4	5.5%
45	503	3,079,737	6,123	21.2	4.9%
46	399	2,604,858	6,528	21.3	3.9%
47	346	2,265,945	6,549	21.8	3.4%
48	339	2,148,244	6,337	22.5	3.3%
49	289	1,914,339	6,624	22.3	2.8%
50	277	1,946,833	7,028	23.3	2.7%
51	285	2,010,955	7,056	24.2	2.8%
52	254	1,860,928	7,326	24.1	2.5%
53	252	1,808,716	7,177	24.8	2.5%
54	198	1,411,242	7,127	24.4	1.9%
55	212	1,682,441	7,936	25.5	2.1%
56	154	1,281,055	8,319	25.9	1.5%
57	139	1,167,130	8,397	25.5	1.4%
58	127	1,068,241	8,411	25.1	1.2%
59	125	1,024,831	8,199	24.8	1.2%
60	101	810,563	8,025	26.3	1.0%

Grade-wise Distribution

Grade	Total Monthly Salary	Number in Grade	Avg. Monthly Salary	Avg. Age	Avg. PS	Distribution
1	7,148,558	2,125	3,364	42	16	20.8%
2	1,511,575	394	3,836	46	21	3.9%
3	271,615	83	3,272	36	11	0.8%
4	303,745	81	3,750	41	15	0.8%
5	5,822,969	1,447	4,024	37	14	14.2%
6	1,156,002	247	4,680	42	17	2.4%
7	7,750,619	1,523	5,089	43	18	14.9%
8	337,200	60	5,620	46	21	0.6%
9	4,393,070	798	5,505	42	17	7.8%
10	6,632,698	1,001	6,626	46	24	9.8%
11	1,350,766	198	6,822	46	22	1.9%
12	2,261,233	289	7,824	50	25	2.8%
13	44,750	6	7,458	48	25	0.1%
14	5,639,810	792	7,121	41	15	7.8%
15	1,343,540	147	9,140	47	22	1.4%
16	5,192,239	518	10,024	46	21	5.1%
17	4,751,172	328	14,485	48	21	3.2%
18	2,410,247	123	19,596	50	24	1.2%
19	946,165	41	23,077	52	26	0.4%
20	116,935	4	29,234	57	32	0.0%

**Summary of Gujranwala District Data
Age-wise Distribution**

Age	Total Number	Total Monthly Salary	Avg. Monthly Salary	Avg. PS	Distribution
20	10	24,205	2,421	1.3	0.0%
21	39	99,365	2,548	2.0	0.2%
22	81	213,065	2,630	2.2	0.4%
23	119	312,855	2,629	2.5	0.5%
24	163	434,435	2,665	1.3	0.7%
25	181	491,435	2,715	3.0	0.8%
26	163	449,503	2,758	3.3	0.7%
27	304	1,173,363	3,860	5.1	1.3%
28	164	535,370	3,264	6.3	0.7%
29	175	603,294	3,447	7.1	0.8%
30	157	543,836	3,464	8.0	0.7%
31	238	871,348	3,661	8.4	1.0%
32	253	983,943	3,889	9.2	1.1%
33	376	1,496,742	3,981	10.6	1.6%
34	583	2,555,409	4,383	12.2	2.5%
35	627	2,901,501	4,628	12.6	2.7%
36	718	3,559,424	4,957	13.8	3.1%
37	1,024	5,228,959	5,106	14.9	4.4%
38	1,094	5,778,091	5,282	15.7	4.8%
39	1,232	6,803,606	5,522	16.5	5.4%
40	1,171	6,682,976	5,707	17.4	5.1%
41	1,231	7,089,610	5,759	18.2	5.3%
42	1,384	7,958,953	5,751	18.9	6.0%
43	1,263	7,306,269	5,785	19.9	5.5%
44	1,199	7,272,435	6,065	20.6	5.2%
45	1,068	6,643,134	6,220	21.1	4.6%
46	862	5,509,454	6,391	21.7	3.7%
47	786	4,973,378	6,327	22.0	3.4%
48	628	4,348,300	6,924	22.7	2.7%
49	709	4,920,767	6,940	23.4	3.1%
50	596	4,428,224	7,430	23.8	2.6%
51	718	5,249,088	7,311	25.3	3.1%
52	670	5,006,639	7,473	25.7	2.9%
53	595	4,719,797	7,932	26.6	2.6%
54	559	4,699,171	8,406	27.2	2.4%
55	445	3,776,252	8,486	27.8	1.9%
56	338	3,210,085	9,497	29.2	1.5%
57	306	2,946,485	9,629	29.3	1.3%
58	256	2,562,481	10,010	31.5	1.1%
59	354	3,221,891	9,101	29.7	1.5%
60	184	2,070,881	11,255	31.5	0.8%

Grade-wise Distribution

Grade	Total Monthly Salary	Number in Grade	Avg. Monthly Salary	Avg. Age	Avg. PS	Distribution
1	13,249,024	3,916	3,383	42	18	17%
2	2,935,565	766	3,832	46	23	3.3%
3	652,720	167	3,909	44	22	0.7%
4	688,060	172	4,000	44	20	0.7%
5	16,835,832	4,120	4,086	36	14	17.9%
6	3,162,583	647	4,888	43	20	2.8%
7	20,033,606	3,883	5,159	43	19	16.9%
8	986,563	190	5,192	43	20	0.8%
9	11,451,180	2,040	5,613	42	18	8.9%
10	9,166,108	1,330	6,892	52	27	5.8%
11	3,098,440	449	6,901	47	24	2.0%
12	3,513,962	450	7,809	50	26	2.0%
13	334,725	42	7,970	51	30	0.2%
14	14,059,569	1,873	7,506	42	18	8.1%
15	3,952,343	418	9,455	48	24	1.8%
16	11,233,128	1,109	10,129	46	22	4.8%
17	13,162,594	920	14,307	47	20	4.0%
18	7,326,720	373	19,643	50	23	1.6%
19	3,332,910	141	23,638	54	27	0.6%
20	480,387	17	28,258	56	28	0.1%

**Summary of Bahawalpur District Data
Age-wise Distribution**

Age	Total Number	Total Monthly Salary	Avg. Monthly Salary	Avg. PS	Distribution
20	15	33,650	2,243	1.1	0.1%
21	37	92,419	2,498	1.6	0.2%
22	67	174,805	2,609	2.0	0.3%
23	82	212,524	2,592	2.5	0.4%
24	105	279,132	2,658	2.7	0.5%
25	145	389,348	2,685	3.1	0.7%
26	143	414,773	2,901	4.4	0.7%
27	234	743,849	3,179	5.5	1.1%
28	180	559,656	3,109	5.9	0.8%
29	210	716,834	3,413	7.0	1.0%
30	187	666,074	3,562	7.4	0.9%
31	314	1,156,735	3,684	8.7	1.5%
32	390	1,494,983	3,833	9.3	1.8%
33	374	1,474,111	3,941	10.5	1.7%
34	508	2,246,796	4,423	11.4	2.4%
35	647	3,012,051	4,655	12.1	3.0%
36	679	3,109,718	4,580	13.2	3.2%
37	879	4,358,973	4,959	13.9	4.1%
38	1,043	5,393,749	5,171	15.2	4.9%
39	1,199	6,323,265	5,274	16.4	5.6%
40	1,065	5,768,850	5,417	17.0	5.0%
41	1,223	6,609,519	5,404	17.9	5.7%
42	1,316	7,498,602	5,698	18.6	6.1%
43	1,204	7,051,358	5,857	19.5	5.6%
44	1,067	6,297,246	5,902	20.4	5.0%
45	1,091	6,728,046	6,167	21.1	5.1%
46	818	5,316,266	6,499	22.0	3.8%
47	934	5,956,151	6,377	22.4	4.4%
48	683	4,574,419	6,698	23.1	3.2%
49	731	5,012,087	6,856	23.9	3.4%
50	578	4,168,715	7,212	25.2	2.7%
51	577	4,440,052	7,695	25.5	2.7%
52	462	3,506,368	7,590	26.7	2.2%
53	458	3,668,058	8,009	26.9	2.1%
54	408	3,554,605	8,712	27.5	1.9%
55	353	3,037,405	8,605	28.3	1.6%
56	244	2,398,336	9,829	29.7	1.1%
57	269	2,743,297	10,198	30.2	1.3%
58	211	2,118,653	10,041	30.5	1.0%
59	326	3,458,068	10,608	32.3	1.5%
60	9	126,875	14,097	35.7	0.0%

Grade-wise Distribution

Grade	Total Monthly Salary	Number in Grade	Avg. Monthly Salary	Avg. Age	Avg. PS	Dsitribution
1	16,802,486	4,995	3,364	41.2	17.2	23.3%
2	3,176,420	830	3,827	46.0	21.9	3.9%
3	748,788	206	3,635	40.0	16.5	1.0%
4	554,828	148	3,749	40.8	15.6	0.7%
5	13,591,430	3,207	4,238	37.4	14.6	14.9%
6	3,057,369	632	4,838	42.2	18.0	2.9%
7	16,986,632	3,274	5,188	41.6	18.5	15.3%
8	600,633	108	5,561	45.8	22.0	0.5%
9	10,449,132	1,848	5,654	41.1	17.7	8.6%
10	8,667,379	1,252	6,923	49.3	26.2	5.8%
11	3,527,289	508	6,943	46.9	24.1	2.4%
12	2,819,466	367	7,682	48.1	23.8	1.7%
13	197,740	28	7,062	43.6	20.0	0.1%
14	10,576,414	1,444	7,324	41.4	16.9	6.7%
15	4,018,287	456	8,812	46.3	22.4	2.1%
16	8,070,970	806	10,014	45.5	20.9	3.8%
17	12,143,951	826	14,702	47.3	21.4	3.8%
18	7,784,012	399	19,509	50.1	23.8	1.9%
19	2,753,630	119	23,140	53.6	26.6	0.6%
20	359,565	12	29,964	56.0	31.9	0.1%

Consolidated Data used for Valuation

Age	Total Number	Distribution	Total Monthly Salary	Avg. Monthly (Adjusted) Salary	Avg. PS	Final Total Number	Final Total Monthly Salary
20	457	0.3%	1,271,385	2,782	1.2	2,180	6,063,503
21	844	0.5%	2,417,243	2,864	1.5	4,025	11,528,341
22	1,252	0.7%	3,635,810	2,904	1.7	5,971	17,339,946
23	1,549	0.9%	4,773,575	3,082	2.2	7,388	22,766,189
24	2,149	1.2%	6,483,880	3,017	2.4	10,249	30,922,993
25	2,404	1.4%	7,396,043	3,077	2.8	11,465	35,273,294
26	2,327	1.3%	7,350,845	3,159	3.4	11,098	35,057,734
27	2,513	1.4%	8,780,923	3,494	4.5	11,986	41,878,080
28	2,281	1.3%	8,109,737	3,555	5.2	10,879	38,677,048
29	2,317	1.3%	8,736,667	3,771	6.5	11,050	41,667,013
30	2,410	1.4%	9,673,309	4,014	7.4	11,494	46,134,054
31	2,868	1.6%	11,772,736	4,105	8.2	13,678	56,146,668
32	3,030	1.7%	13,198,655	4,356	8.9	14,451	62,947,177
33	3,516	2.0%	16,132,550	4,588	10.2	16,769	76,939,543
34	3,947	2.2%	19,483,224	4,936	11.0	18,824	92,919,613
35	4,855	2.7%	25,396,179	5,231	11.5	23,155	121,119,746
36	5,178	2.9%	28,602,788	5,524	13.1	24,695	136,412,741
37	7,205	4.1%	42,355,578	5,879	14.0	34,362	202,002,703
38	8,449	4.8%	50,596,021	5,988	14.7	40,295	241,303,121
39	9,308	5.2%	57,325,162	6,159	15.0	44,392	273,395,814
40	9,173	5.2%	59,102,521	6,443	15.8	43,748	281,872,414
41	9,177	5.2%	59,697,977	6,505	16.2	43,767	284,712,272
42	9,566	5.4%	63,868,780	6,677	16.3	45,622	304,603,713
43	8,798	5.0%	59,925,953	6,811	16.8	41,960	285,799,536
44	8,387	4.7%	58,958,744	7,030	16.5	39,999	281,186,712
45	7,635	4.3%	56,918,614	7,455	17.5	36,413	271,456,900
46	6,058	3.4%	46,765,818	7,720	18.1	28,892	223,036,069
47	6,263	3.5%	49,462,724	7,898	18.2	29,870	235,898,188
48	5,193	2.9%	43,091,215	8,298	18.3	24,767	205,511,115
49	5,270	3.0%	44,028,303	8,355	18.6	25,134	209,980,283
50	4,504	2.5%	40,309,971	8,950	19.1	21,481	192,246,771
51	4,793	2.7%	43,403,167	9,056	20.0	22,859	206,998,877
52	4,118	2.3%	38,317,770	9,305	20.6	19,640	182,745,543
53	3,819	2.2%	36,762,228	9,626	20.6	18,214	175,326,838
54	3,296	1.9%	33,698,360	10,224	21.1	15,719	160,714,601
55	3,040	1.7%	31,430,656	10,339	21.2	14,498	149,899,440
56	2,283	1.3%	25,725,398	11,268	22.0	10,888	122,689,859
57	2,327	1.3%	26,986,231	11,597	22.8	11,098	128,703,039
58	1,856	1.0%	23,743,229	12,793	22.6	8,852	113,236,476
59	2,042	1.2%	25,455,162	12,466	23.7	9,739	121,401,047
60	1,028	0.6%	13,549,432	13,180	22.9	4,903	64,620,106
Total	177,485					846,464	5,793,135,123

Appendix II

Contract employees break-up

**Contract Employees in Districts as per SAP R/3 system,
as on 31.07.2007**

Sr.#	District	No. of Contract employees
1	Faisalabad	4,889
2	Jhelum	1,970
3	Layyah	1,000
4	Okara	2,444
5	Sargodha	3,316
6	Bahawalpur	752
7	Gujrat	1,570
8	Khanewal	2,440
9	Multan	2,209
10	Sahiwal	1,789
11	Attock	1,290
12	Gujranwala	821
13	Kasur	2,101
14	Lodhran	1,353
15	Rawalpindi	1,782
16	Sheikhupura	1,629
17	Lahore	3,682
	Total	35,037

Appendix III

Sanctioned Posts Break-up

STATEMENT SHOWING THE TENTATIVE NUMBER OF ACTIVE EMPLOYEES

BASIC SCALE	TOTAL NUMBER OF POSTS	NUMBER OF VACANCIES	NUMBER OF ACTIVE EMPLOYEES
1	161,595	21,396	140,199
2	20,965	1,367	19,598
3	2,310	480	1,830
4	9,974	1,522	8,452
5	130,502	8,300	122,202
6	16,171	3,127	13,044
7	157,739	14,576	143,163
8	2,077	1,688	389
9	140,932	17,187	123,745
10	772	77	695
11	21,012	2,517	18,495
12	5,701	1,145	4,556
13	874	55	819
14	23,321	4,206	19,115
15	2,083	235	1,848
Total:	696,028	77,878	618,150
16	39,743	6,476	33,267
17	29,621	4,785	24,836
18	9,244	6,614	2,630
19	2,467	2,465	2
20	1,338	255	1,083
21	47		
22	3		
Unclassified	11,072		
Total:	93,535	20,595	61,818
Grand Total:	789,563	98,473	679,968

**SCALE WISE NUMBER OF POSTS IN B.E.2006-2007
(DISTRICT GOVERNMENTS)**

Sub #	District	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total (1-15)	16	17	18	19	20	21	22	Total (16-22)	Un-Classified Posts	Grand Total	
1401	Rawalpindi	5665	97	20	391	1689	609	1899	128	11302	3	504	68	5	1613	41	24034	1534	1410	743	218	48	0	0	4353	7	28394	
1402	Attock	3693	187	20	137	953	455	4423	56	3374	3	281	66	3	521	44	14418	1250	706	89	17	1	0	0	0	2063	0	16481
1403	Jhelum	2416	84	20	179	714	288	3001	71	1698	30	233	54	1	508	26	9323	766	487	77	24	7	0	0	0	1361	1292	11976
1404	Chekhwal	3309	128	11	262	1170	620	3660	27	2559	1	293	68	3	419	28	12558	953	801	170	64	1	0	0	0	1989	1489	16036
1405	Sargodha	4867	150	6	272	1246	680	6458	82	3683	43	347	42	5	610	31	18522	1549	512	111	33	9	0	0	0	2014	2467	23003
1406	Mianwali	3061	91	19	195	788	352	3579	110	1778	1	217	53	3	442	40	10729	572	456	128	134	2	0	0	0	1292	1882	13903
1407	Bhakkar	2704	75	6	177	720	384	3044	66	1471	2	200	43	2	333	26	9253	534	281	112	52	2	0	0	0	981	1345	11579
1408	Khushab	2287	61	8	180	671	332	3725	47	1369	1	208	43	3	378	65	9378	635	382	73	36	1	0	0	0	1127	69	10574
1409	Gujranwala	5647	104	14	456	1319	741	5737	310	4452	39	372	95	11	840	97	20234	1523	1404	366	101	16	0	0	0	3410	2277	25921
1410	Hatizabad	1635	40	10	130	482	201	1775	57	1118	6	145	74	3	104	45	5825	345	333	80	42	3	0	0	0	803	809	7437
1411	Gujrat	3778	206	13	130	1099	494	5456	107	1192	114	308	281	6	2497	29	15710	1300	653	123	22	2	0	0	0	2100	1959	19769
1412	Sialkot	3277	130	86	271	1124	496	6804	116	3219	18	309	79	5	634	40	16808	2347	421	157	87	9	0	0	0	3021	1402	21031
1413	Narawal	2617	59	3	173	733	382	4907	64	1725	4	227	55	3	994	27	11973	717	343	54	28	1	0	0	0	1143	1541	14657
1414	M.B. Din	2015	56	7	158	607	302	428	65	4197	6	236	45	3	366	22	8511	684	442	55	32	1	0	0	0	1214	801	10526
1415	Lahore	16122	339	37	402	2881	634	9513	699	5060	28	671	195	17	497	91	37186	2795	1234	148	82	1	1	0	0	4281	1858	43305
1416	Sheikhpura	3133	103	7	279	801	561	4658	198	2435	8	292	63	6	709	43	13296	798	682	101	52	13	0	0	0	1646	1729	16671
1417	Kasur	3472	165	24	173	1108	414	5063	45	2219	294	311	291	18	1113	189	14900	1006	403	241	62	0	0	0	0	1712	1081	17693
1418	Okara	4230	78	13	106	996	516	6364	111	3208	3	350	76	2	616	20	16689	1095	861	161	47	1	0	0	0	2165	41	18895
1419	Multan	5838	160	52	195	1358	401	5681	206	2597	120	494	146	8	640	82	17879	1009	571	208	86	4	0	0	0	1880	1646	21405
1420	Lodhran	2004	104	5	132	558	212	896	58	1164	644	195	324	7	629	111	7033	335	359	90	37	1	0	0	0	822	1320	9175
1421	Vehari	3694	108	4	337	1018	511	4806	117	2887	3	273	58	2	832	43	14693	958	760	262	61	5	0	0	0	2046	831	17570
1422	Sahiwal	3376	81	9	230	1069	513	4825	81	3015	15	280	52	6	665	28	14045	1114	963	253	99	9	0	0	0	2428	1296	17769
1423	Pakpattan	1910	98	3	120	608	275	2207	74	1081	83	210	110	3	629	135	7546	357	424	106	46	1	0	0	0	934	1124	9604
1424	Khanewal	3594	324	5	93	863	469	4820	89	3039	1	292	54	3	582	29	14377	949	418	195	44	1	0	0	0	1607	2245	18229
1425	Faisalabad	9730	782	90	256	1138	1072	5762	298	5673	2414	579	882	9	3313	694	32893	2096	1401	400	153	4	0	0	0	4054	2547	39294
1426	T. T. Singh	3708	72	2	188	856	411	5127	100	3234	1	266	48	2	743	23	14781	1202	711	149	66	1	0	0	0	2129	2891	24813
1427	Jhang	5514	112	24	289	1322	648	7056	173	1916	1	252	65	7	387	36	12712	807	623	87	154	15	0	0	0	1686	1929	16327
1428	D.G. Khan	3307	118	22	269	1044	427	4788	73	1916	1	189	75	3	220	244	7981	350	303	94	44	2	0	0	0	793	1052	9826
1429	Rajapur	2108	259	7	181	669	266	2680	50	1038	12	169	75	3	309	53	14191	828	594	245	66	3	0	0	0	1736	2026	17953
1430	Muzaffargarh	3621	100	17	240	1178	551	5087	85	2264	1	309	53	3	648	34	14191	828	594	245	66	3	0	0	0	1291	1725	13262
1431	Layyah	2838	370	11	129	462	328	2472	60	1595	573	1368	49	6	567	63	17610	1233	515	116	44	4	0	0	0	1912	0	19522
1432	Bahawalpur	4819	175	53	239	1150	592	1399	102	8027	1	368	49	6	567	63	17610	1233	515	116	44	4	0	0	0	2466	2307	23128
1433	Bahawalnagar	5464	79	12	251	1271	687	198	120	8323	1	1104	103	3	700	39	18355	1370	940	117	37	2	0	0	0	2159	18	25493
1434	R.Y. Khan	6438	143	11	302	1313	726	9075	114	3732	0	361	70	5	990	36	23316	1371	678	87	21	2	0	0	0	1418	1157	11666
1435	Nankana Sahabi	2287	72	2	202	566	402	2844	78	1296	175	223	160	2	859	123	9291	566	595	110	146	1	0	0	0	68170	46163	639797
TOTAL		144379	653	7724	35566	16862	150005	4238	110237	4651	11421	4249	178	27021	2870	525464	36865	22810	5853	2443	178	1	0	0	68170	46163	639797	

Note : * No. of posts reflected as per F.Y. 2004-2005

†:data\admission\district information\wp.2006-07 (compiled)

GOVERNMENT OF THE PUNJAB (PROVINCIAL)
DEPARTMENT AND BPS WISE NUMBER OF POSTS 2007-2008

No. & Name of the Grant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total 1-15	16	17	18	19	20	21	22	Total 16-22	SPECIAL GRADE	GRAND TOTAL
1 Opium	21	1			5	1					1					30								1		31
2 Land Revenue	16	6		2	32	5		2			13	4		4		84	6	2	1	1				10		94
3 Provincial Excise	29	1		14	14	3					25	1		5		96	5	6	1	2				14		110
4 Stamps	17					2										20	14	2	1					17		37
5 Forests	1,374	159	75	229	3,406	1	782	34	75	16	127	54	1	8	15	6,356	195	127	46	12	3			363		6,739
6 Registration	4				4		6				1					15	1							1		16
7 Charges on A/c of M V Act	11	1		2	9	2	5				96	4				131	2	5	1	2	1			11		142
8 Other Taxes and Duties	43	9		25	41	9	22				55	10	1	3		218	10	19	5	2	2		38	3	269	
9 Irrigation	20,287	2,968	5,484	713	8,822	655	926	15	370	113	1,870	109	110	476	1	42,919	238	502	196	41	12	1		990		43,909
10 General Administration	4,801	411	141	1,108	2,909	23	695	6	109	8	980	1,252	47	1,119	566	13,838	928	1,973	816	217	111	16	14	4,075	439	18,352
11 Administration of Justice	3,041	319	2,289	735	3,237		1,132	29	1	328	268			76	129	12,094	1,160	1,219	350	374	38	1		3,142	98	15,334
12 Jail & Convict Settlements	899		16	74	7,540	91	861	44	103	2	72	47	1	370		10,120	110	82	35	7	1			235		10,355
13 Police	6,004	578	210	53	114,444	1	18,025	1	12,381		597	517		14,893	166	167,870	5,565	775	216	36	31	18	1	6,662	11	174,543
15 Education	8,886	93	1	304	794	102	4,013	8	428	14	793	232		3,067	55	18,788	2,318	10,434	5,505	1,657	544			20,458		39,246
16 Health Services	3,343	763	154	232	714	493	194	70	377	21	209	125	1	19	27	6,742	1,689	1,672	707	178	51	1		4,298	77	11,117
17 Public Health	370	7		83	195	9	51		38	1	221	36	30		5	1,046	68	61	28	13	3			173		1,219
18 Agriculture	4,726	798	209	547	2,408	2,198	850	15	80	22	591	203	1	24	45	12,717	142	1,511	238	40	6			1,937		14,654
19 Fisheries	811	10	72	120	77	85	64	15	1	159	26					1,440	17	80	21	4	1			123		1,563
20 Veterinary	2,587	155	16	217	360	629	144	6	30	75	209	49			25	4,502	42	380	237	14	2			675		5,177
21 Co-Operation	164	6	1	8	75	101	41	1			73	12				482	26	8	4	6				44		526
22 Industries	371	10	8	66	212	20	131	4	48	33	136	93	1	26	4	1,163	88	86	44	16	2			236	4	1,403
23 Misc. Department	1,773	101	89	235	270	48	246	69	36	1	251	155	16	10	15	3,325	75	191	83	20	16			365		3,710
24 Civil Works	1,398	409	131	413	506	291	160	3	157		515	81	87		5	4,156	110	155	51	22	3			341		4,497
25 Communication	3,178	522	9	329	610	154	77	13	164	9	319	53	45	8	6	5,496	70	89	55	16	3			233		5,729
26 Housing & Phy. Planning	164	2		26	124	1	24		43		97	40	31		1	553	34	24	34	10	1			103		656
27 Relief	18	1		6	9		6				16	4			3	63	4	5	1	1				11		74
29 Stationery	29	35	43	6	36	52	74	2	16	3	9	9		6	2	322	9	4	2	1				16		338
31 Miscellaneous	596	22	1	183	310	3	78	4	7		340	205	12	7	10	1,778	52	241	54	11	7			365	1	2,144
32 Civil Defence	55	2	12	41	37	3	10	7			11	5			1	184	7	4	2	1				14		198
TOTAL	64,816	7,389	8,854	5,771	147,202	4,971	28,626	346	14,463	319	8,614	3,584	384	20,122	1,077	316,548	13,005	19,666	8,734	2,703	838	38	15	44,991	633	362,172

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Appendix IV

Salary Increase Rates Used

Age	Salary Increase	Age	Salary Increase
20	10.4%	41	14.3%
21	12.1%	42	13.7%
22	11.6%	43	14.0%
23	11.4%	44	13.9%
24	10.1%	45	14.8%
25	9.9%	46	14.0%
26	9.8%	47	14.1%
27	10.2%	48	13.7%
28	11.2%	49	14.2%
29	10.3%	50	14.1%
30	9.8%	51	14.4%
31	11.2%	52	14.6%
32	11.4%	53	14.2%
33	12.1%	54	14.8%
34	13.4%	55	14.4%
35	12.8%	56	15.1%
36	12.9%	57	14.1%
37	14.0%	58	14.6%
38	13.9%	59	15.5%
39	13.7%	60	11.5%
40	13.8%		

Appendix V

Summary of Pensioners Movement Report from January 2005 to June 2006

Pensioner's Addition Analysis
Net change of Pensioner's each month

	2006	2005
January	721	679
February	732	743
March	785	853
April	685	610
May	753	579
June	732	712
July		865
August		1,044
September		1,004
October		967
November		819
December		776

Appendix VII

Age wise Distribution of Pensioners

Age	Number of Pensioners			Age	Number of Pensioners		
	Family	Early Retirement	Normal Retirement		Family	Early Retirement	Normal Retirement
33	16	0	0	62	2,702	8,138	9,393
34	48	0	0	63	2,845	8,074	9,679
35	32	0	0	64	2,718	6,850	9,377
36	64	0	0	65	2,670	8,901	9,568
37	111	0	0	66	2,813	5,483	8,535
38	223	0	0	67	3,242	5,913	8,185
39	445	0	0	68	3,147	5,420	7,534
40	381	0	0	69	3,338	5,118	9,727
41	429	0	0	70	3,115	4,721	6,469
42	842	111	0	71	3,322	5,483	6,564
43	747	207	0	72	3,401	2,352	6,977
44	954	302	0	73	3,401	2,638	6,882
45	985	636	0	74	3,528	2,257	8,519
46	1,001	1,033	0	75	3,354	1,764	6,882
47	1,303	1,367	0	76	2,734	1,510	4,848
48	1,128	1,939	0	77	2,893	1,430	4,355
49	1,240	3,354	0	78	1,462	826	2,273
50	1,287	5,261	0	79	1,415	413	2,162
51	1,764	6,469	0	80	1,256	477	1,510
52	1,542	7,248	0	81	1,319	413	1,017
53	1,875	7,772	0	82	1,367	540	1,605
54	1,494	7,534	0	83	1,287	413	1,399
55	2,034	8,344	0	84	1,256	620	1,256
56	1,653	6,930	0	85	1,208	191	1,367
57	1,907	8,011	0	86	715	175	842
58	1,748	7,597	0	87	747	16	922
59	1,971	7,852	0	88	509	32	509
60	2,130	8,360	0	89	429	191	79
61	2,225	8,503	2,845	90	397	32	64

Age-wise Net Monthly Pensions after Indexation

Age	Avg. Net Monthly Pension after Indexation			Age	Avg. Net Monthly Pension after Indexation		
	Family	Early Retirement	Normal Retirement		Family	Early Retirement	Normal Retirement
33	498	0	0	62	1,427	1,916	3,725
34	301	0	0	63	1,362	2,059	3,835
35	216	0	0	64	2,211	1,732	4,248
36	457	0	0	65	1,244	1,806	3,594
37	486	0	0	66	1,212	1,859	2,578
38	395	0	0	67	1,464	1,918	2,049
39	433	0	0	68	1,439	2,010	3,059
40	429	0	0	69	1,677	2,187	2,690
41	504	0	0	70	1,471	2,038	3,670
42	560	846	0	71	2,322	2,292	3,384
43	513	897	0	72	1,462	1,737	3,240
44	638	838	0	73	1,876	1,732	3,116
45	650	873	0	74	1,589	1,879	2,673
46	701	988	0	75	1,449	5,029	2,536
47	757	1,055	0	76	1,733	2,056	3,318
48	642	1,148	0	77	1,892	2,130	2,886
49	931	1,291	0	78	1,534	1,794	2,759
50	869	1,250	0	79	1,730	2,008	3,021
51	860	1,254	0	80	1,634	1,522	2,255
52	1,429	1,263	0	81	1,785	2,284	2,823
53	1,188	1,269	0	82	1,888	2,309	2,322
54	963	1,349	0	83	1,589	2,649	3,069
55	973	1,364	0	84	1,574	2,526	1,543
56	1,251	1,406	0	85	1,568	1,983	1,986
57	1,121	1,441	0	86	2,033	4,671	3,122
58	1,192	1,542	0	87	1,902	5,967	4,847
59	1,829	1,611	0	88	1,986	6,899	4,013
60	1,840	1,673	0	89	2,322	2,536	1,831
61	1,325	1,917	3,567	90	3,480	6,331	1,777

Appendix VIII

Mortality Rates

The following table shows the age-based in-service mortality rates used for the purpose of valuation. The rates are those of the standard EFU 61–66 mortality table used for actuarial work in Pakistan.

Age	Mortality Rates		Age	Mortality Rates
20	0.89		53	16.35
21	0.94		54	18.25
22	0.99		55	20.26
23	1.04		56	22.36
24	1.10		57	24.55
25	1.17		58	26.85
26	1.24		59	29.28
27	1.32		60	31.86
28	1.40		61	34.60
29	1.49		62	37.54
30	1.59		63	40.71
31	1.71		64	44.13
32	1.84		65	47.82
33	1.98		66	51.80
34	2.14		67	56.09
35	2.32		68	60.72
36	2.52		69	65.71
37	2.75		70	71.11
38	3.01		71	76.96
39	3.31		72	83.28
40	3.65		73	90.13
41	4.04		74	97.54
42	4.49		75	105.55
43	5.00		76	114.23
44	5.58		77	123.62
45	6.26		78	133.78
46	7.03		79	144.77
47	7.92		80	156.67
48	8.96			
49	10.14			
50	11.47			
51	12.95			
52	14.58			

Note: All rates are per 1000

For mortality of pensioners, the same rates as above were used but with a setback of five years.

For disability retirements, the same rates as above were used but with a set-forward of three years from the actual age.

Turnover, Disability and Early Retirement Rates

The employee turnover, disability and early retirement rates used in the valuation are shown in the table below. The rates are based on the experience of public-sector employee benefit schemes in Pakistan.

Age	Withdrawal Rates	Disability Rates	Early Retirement Rates
20	125.00	-	-
21	85.70	-	-
22	96.80	-	-
23	65.30	-	-
24	44.00	-	-
25	29.70	-	-
26	47.90	-	-
27	31.10	-	-
28	20.40	-	-
29	13.50	-	-
30	9.00	0.50	-
31	6.00	0.55	-
32	15.00	0.59	-
33	9.40	0.64	-
34	6.00	0.69	-
35	3.90	0.74	-
36	2.60	0.78	-
37	1.70	0.83	-
38	7.30	0.88	-
39	4.50	0.92	-
40	2.80	0.97	-
41	1.80	1.02	-
42	1.20	1.06	-
43	0.80	1.11	-
44	0.50	1.16	-
45	0.40	1.21	10.00
46	0.20	1.25	10.00
47	0.10	1.30	10.00
48	0.10	2.10	10.00
49	0.10	2.10	14.70
50	-	2.20	19.40
51	-	2.20	24.10
52	-	2.30	28.80
53	-	2.30	33.50
54	-	2.40	38.20
55	-	2.40	42.90
56	-	2.50	47.60
57	-	2.50	52.30
58	-	2.60	57.00
59	-	2.60	61.70
60	-	-	-

Note: All rates are per 1000

Appendix IX

Summary of the Benefit Structure of Punjab Government Pension Scheme

The Pension Scheme Members of Punjab Government were entitled to the following pension benefits on normal and early retirement, death and disability as at June 30, 2006:

Normal Retirement Pension

The normal retirement age is 60 years.

If service is less than 5 years:

- Nil Benefit

If service is greater than 5 and less than 10 years:

- A lump sum gratuity is payable. The rate of gratuity is calculated as per the following formula:

$$\text{Gratuity} = \text{Last Drawn Pensionable Salary} \times \text{Pensionable Service}$$

If service is greater than 10 years:

- The rate of pension at normal retirement age is 2.33% of the last drawn pensionable salary for each year of service subject to a maximum service period of 30 years. The maximum pension amount is thus limited to 70% of the last drawn pensionable salary

The employees can surrender upto a maximum of 40% of the gross pension in lieu of a lumpsum-commuted value. The commuted value at age 60 shall be calculated as per the following formula:

$$\text{Commuted Value} = 12.37 \times \text{amount of pension surrendered} \times 12$$

Early Retirement Pension

Early retirement is applicable on the completion of 25 years of continuous service.

- The rate of pension at early retirement age is 2.33% of the last drawn pensionable salary for each year of service subject to a maximum service period of 30 years. The maximum pension amount is thus limited to 70% of the last drawn pensionable salary

The employees can surrender upto a maximum of 40% of the gross pension in lieu of a lumpsum-commuted value.

Death in Service

If service is less than 5 years:

- Nil

If service is greater than 5 and less than 10 years:

- A lump sum gratuity is payable. The rate of gratuity is calculated as per the following formula:

$$\text{Gratuity} = 1.5 \times \text{Last Drawn Pensionable Salary} \times \text{Service}$$

If service is greater than 10 years:

- The basic pension shall be 2.33% of the last drawn pensionable salary for each year of service subject to a maximum service period of 30 years

$$\text{Widow's Pension} = 50\% \times \text{basic pension}$$

Widow's pension is paid to eligible children in case of death of the widow. Eligible children are defined as legal male child under the age of 21 years and legal unmarried daughter

In addition to the above, the widow is entitled to 25% of the commuted value of gross pension. The age based commutation factors are set out in the table (later in the section)

Death after Retirement

In case of death after retirement, the widow is entitled to receive 50% of the pension being received by the retiree.

Widow's pension is paid to eligible children in case of death of the widow. Eligible children are defined as legal male child under the age of 21 years and legal unmarried daughter. In the absence of widow and eligible children, the pension is payable to the dependents (such as parents, widow daughter etc.) for the remaining guaranteed period

Ill-health Pension

If service is less than 5 years:

- Nil

If service is greater than 5 and less than 10 years:

- A lump sum gratuity is payable. The rate of gratuity is calculated as per the following formula:

$$\text{Gratuity} = 1.5 \times \text{Last Drawn Pensionable Salary} \times \text{Service}$$

If service is greater than 10 years:

- The basic pension is 2.33% of the last drawn pensionable salary for each year of service subject to a maximum service period of 30 years.

The employees can surrender upto a maximum of 40% of the gross pension in lieu of a lumpsum-commuted value.

Following is the age – based commutation table showing commutation factors at ages 20 – 60.

Age	Commutation Factors	Age	Commutation Factors	Age	Commutation Factors
20	40.5043	36	28.3362	52	17.0050
21	39.7341	37	27.5908	53	16.3710
22	38.9653	38	26.8482	54	15.7517
23	38.1974	39	26.1009	55	15.1478
24	37.4307	40	25.3728	56	14.5602
25	36.6651	41	24.6406	57	13.9888
26	35.9006	42	23.9126	58	13.4340
27	35.1372	43	23.1840	59	12.8953
28	34.3750	44	22.4713	60	12.3719
29	33.6143	45	21.7592		
30	32.8071	46	21.0538		
31	32.0974	47	20.3555		
32	31.3412	48	19.6653		
33	30.5869	49	18.9841		
34	29.8343	50	18.3129		
35	29.0841	51	17.6526		