Assumptions of i-TAP

Conceptualised & Developed by
India Pensions Research Foundation*

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*Please forward your suggestions and queries to info@iief.com

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1 Assumptions

i-TAP is a tool for analysis of defined contribution pension systems. The inputs to i-TAP are the following

- Contributions to the pension account: This is dependant on ones salary, growth in salary and percentage of the salary contributed to the account.
- Investment choices: The percent contributed in each scheme and the rate of return earned on each.
- Charges levied: The different kinds of charges levied by the service providers on the members.
- Benefits received: This is the allocation of terminal accumulations between a lump-sum withdrawal and an annuity.

i-TAP assumes certain values as default for each of the above mentioned parameters. The document explains in detail the default values assumed by i-TAP as well as the rationale behind the assumptions. The user is free to change the default values.

1.1 Assumptions on contributions

The assumptions on contributions include those on contributions of central government employees, state government employees and people who enter the system on a voluntary basis.

1.1.1 Central government employees

The new pension scheme commenced for the Central Government Employees from January 1 2004. The scheme is applicable only to the new entrants in the Central Government service. The contribution rate for the employee is 10% of (basic + DA). The same amount is to be contributed by the employer i.e. the central government.

To arrive at the contribution amount, i-TAP assumes a basic pay for each group in the central government. There are four groups Group A, Group B, Group C and Group D. The following scales of basic pay[1] and pay progression schedules (based on discussions with experienced government employees) have been considered as default values for each group of central government employees:

Group A

First Year Basic: Rs.8000 with increments at the rate of Rs.275 pm each year till 5^{th} year. This means that a new employee will start with a salary of Rs.8000. The next year he will have an increment of Rs.275 next year i.e. he will draw a salary of Rs.8275 p.m in the second year. This increment will continue for four years.

Next scale after 5 years: Rs.10000 with increments of Rs.325 pm each year till 11^{th} year. This means that after five years, the employee will jump to a salary of Rs.10000 and for the next five years enjoy increments of Rs.325

After 11^{th} year: Rs.12375 with increments of Rs.375 pm each year till retirement.

Group B

First Year Basic: Rs.4500 with increments at the rate of Rs.125 pm each year till 5^{th} year.

Next scale after 5 years: Rs.5500 with increments of Rs.175 pm each year till 11^{th} year

After 11^{th} year: Rs.6700 with increments of Rs.200 pm each year till retirement.

[1] Based on Fifth Pay Commission Report

Group C

First Year Basic: Rs.3050 with increments at the rate of Rs.70 pm each year till 10^{th} year

After 10^{th} year: Rs.4000 with increments of Rs.100 pm each year till retirement.

Group D

First Year Basic: Rs.2550 with increments at the rate of Rs.45 pm each year till 10^{th} year

After 10^{th} year: Rs.3050 with increments of Rs.70 pm each year till retirement.

1.1.2 State government employees

The following scales of basic pay[2] and pay progression schedules (based on discussions with experienced government employees) have been considered as default values for each group of state government employees:

Group A

First Year Basic: Rs.7220 with increments at the rate of Rs.220 pm each year till 5^{th} year

Next scale after 5 years: Rs.8380 with increments of Rs.250 pm each year till 11^{th} year

After 11^{th} year: Rs.10350 with increments of Rs.325 pm each year till retirement.

Group B

First Year Basic: Rs.6400 with increments at the rate of Rs.200 pm each year till 5^{th} year

After 5^{th} year: Rs.7670 with increments of Rs.225 pm each year till retirement.

Group C

First Year Basic: Rs.3120 with increments at the rate of Rs. 70 pm each year till 6^{th} year

Next scale after 6 years: Rs.3500 with increments of Rs.85 pm each year till 15^{th} year

After 15^{th} year: Rs.4550 with increments of Rs.100 pm each year till retirement.

Group D

First Year Basic: Rs.2520 with increments at the rate of Rs.45 pm each year till 10^{th} year

After 10^{th} year: Rs.2995 with increments of Rs.55 pm each year till retirement.

1.1.3 Voluntary members

The model assumes the default value of contribution of Rs.3600 per annum[3] and 6 transactions per year. This is done by assuming a monthly income of Rs.3000 and a contribution of 10%. i-TAP makes a provision for the individual to increase his contributions as his income grows. This is done by assuming a growth rate in income of 3%.

1.2 Assumptions on investment guidelines

The model assumes that of the total contribution flowing in the system every year, 60% are invested in the safe schemes, 20% in balanced and 20% in the growth schemes. The system, however offers the user flexibility of changing portfolio choices.

[2]Economic and Statistical Organisation, Punjab. These scales have been assumed for all the states.

[3]The figure of Rs.3600 has been arrived at by assuming that a person can save Rs.10 a day

1.2.1 Safe scheme

The composition of safe scheme is assumed to be follows

Amount invested in	% invested
G-secs	60
Corporate bonds	30
Equity	5
International equity	5

1.2.2 Balanced scheme

The composition of balanced scheme is assumed to be as follows

Amount invested in	% invested
G-secs	40
Corporate bonds	35
Equity	20
International equity	5

1.2.3 Growth scheme

The composition of growth scheme is assumed to be as follows

Amount invested in	% invested
G-secs	20
Corporate bonds	30
Equity	40
International equity	10

The composition of each of the schemes is based on indicative investment guidelines mentioned in the OASIS Committee Report. The real return on government securities is assumed to be 2%, 4% on corporate bonds, 6% on domestic equities and 9% on international equities[4]. Using the real returns and the percent invested in each scheme, the model calculates the interest rate applicable by a weighted average formula. The user can calculate the returns in nominal terms by specifying the inflation rate upfront. The inflation rate will be incorporated in the model automatically.

[4]Returns on international equities are based on http://www.finfacts.com/equity2004.htm

1.2.4 Life style investment

i-TAP provides for the flexibility to change ones portfolio according to ones age. In the life style investment option, an individual can change his asset allocation over the years. For example, for the first ten years he can choose to put a greater proportion of his accumulations into the growth scheme. As he nears retirement, he can shift his balances to the safe scheme to avoid any risk prior to retirement.

1.3 Assumptions on charges

There are three service providers in the system: the POPs, the CRA and the PFMs. The charges may be flat fee annual charges, transaction (deposit) based charges, transaction (switch) based charges, contribution based charges or charges based on assets under management. The POP charge is applicable to the voluntary members only because the government employees deductions are made by the P&AOs. The POPs are assumed to charge a transaction based fee of Rs.25/- per transaction. The CRA charge has been assumed to be Rs.20/- per annum per account and Rs.5/- per transaction. The PFM charges have been assumed to be 0.50% of the assets under management per year. The model provides the flexibility of allowing for deduction of both real and nominal charges.

The user may compute the sensitivity of accumulations to various kinds of charges for each service provider, i.e. though the default values specify only transaction based charge for POPs, the user may opt for contribution based charges for POPs. The model also assumes that a certain percentage (0.10%) of the AUM is charged to consumers as PFRDA charges. Though the service providers will pay these charges to PFRDA, these regulatory expenses will be allowed as pass through and hence will impact the members.

1.3.1 Productivity changes of service providers

i-TAP provides for a productivity change in the operations of various service providers. Over time technical improvements and improvements in allocative efficiency will increase the productivity of the service providers. i-TAP provides for a reduction in real charges of the CRA on account of productivity growth.

1.3.2 AUM charges for the system

i-TAP provides the flexibility for the AUM charges of the PFM to fall as the assets under management rise. In the system and the group analysis, once the total assets in the system or group rise to Rs.15000 crore, the AUM charge falls to 30bps from 50bps. The charges subsequently change every time the AUM in the system rises by Rs.2500 crore. The user has the flexibility to change the limits of Rs.15000 crore and Rs.2500 crore as well as the charges.

1.4 Assumptions on inflation

i-TAP assumes all contributions and charges in real terms i.e. at 2003-04 prices. However there is a provision to change the rates to factor in inflation.

1.5 Assumptions on compounding

i-TAP assumes continuous compounding to calculate terminal accumulations.

1.6 Assumptions on benefits

For finding out the benefits (monthly pension) due to the member, i-TAP draws upon from the existing rates of the LIC New Jeevan Akshay I scheme (the only immediate annuity sold in India). i-TAP gives the following option to the user

- Percent of accumulations to be annuitised
- The life annuity a single premium of Rs.1000 will buy
- The survivor annuity a single premium of Rs.1000 will buy

The monthly pension is then calculated as follows.

- The figure entered in percent of accumulations to be annuitised (for example 40%) is used to calculate the amount to be annuitised from the total accumulations. If the total accumulations of a member are Rs.100000, the the amount annuitised would be Rs.40000. This would be the premium the member would pay the insurance company.
- The available rates are then used to calculate the immediate annuity that will be purchased with the premium calculated in the above step. This will be calculated as follows

- If Rs.1000 buys you a yearly life annuity of Rs.86.70, then Rs.40000 would buy you an annuity of (40,000*86.70)/1000 = Rs.3468 per year.
- This would translate to a monthly annuity of Rs.3468/12 = Rs.289

In addition LIC offers discounts to high value customers. The discounts are shown in Table 1

This indicates that if the amount annuitised is between 50,000 and 99,999, and if the annuity rate is 86.00 per thousand, then LIC will add Rs.2.9 per thousand to the 86.00. The effective rate on the annuity then will be 88.9 per thousand.

1.7 Assumptions on total number of members

The system will essentially comprise of mandatory members i.e. the new central government employees, and the voluntary members i.e. people outside of the central government who join of their own volition. The state government employees are likely to join the system after a period of time.

1.7.1 Assumptions on new entrants to the central government

There is a paucity of data available on new entrants to the central government. i-TAP bases this number from data available from the Planning Commission on total number of employee in the central government, the growth rate of employees and the retirement rate per year. Using these numbers, i-TAP arrives at new entrants to the central government every year. This is then segregated into new entrants into each of the groups by using the composition of the central government as of 1997-98. The total number of government employees (excluding uniformed armed forces) has been assumed to be 3847049[5]. Pranab Sen et. al. in a Planning Commission paper[6] have provided data on the number of central government employees (Civil only). The data on number of employees after 1991 indicates a growth of 0.31% and an average retirement rate of 1.75% per year. The percentage of total employees in each of the Group A/B/C/D were 2.01%, 4.58%, 63.72% and 29.69%[7] respectively in the year 1997-98. The same percentages are assumed for apportioning new employees in various groups.

Using these numbers, and the contribution, charges and investment assumptions mentioned above, i-TAP arrives at total contributions and subsequently total accumulations of each group of central government as a whole.

1.7.2 Assumptions on new entrants to the state government

The new pension scheme has commenced for the central government employees from January 1 2004. The state governments are likely to follow suit and it has been

[5] Brochure on Pay and Allowances of Central Government Civilian Employees, 1997-98, Pay Research Unit, Department of Expenditure, Ministry of Finance, New Delhi.

[6] Technical study on retirements and pension projections of the central government, Pranob Sen and Sibani Swain, Perspective Planning Division, Planning Commission, Government of India, New Delhi, January 2002.

[7] Brochure on Pay and Allowances of Central Government Civilian Employees, 1997-98, Pay Research Unit, Department of Expenditure, Ministry of Finance, New Delhi.

Table 1 LIC discounts to high value customers

	< 50,000	50,000-99,999	100,000-199,999	200,000 and above
Monthly annuity	NIL	2.9	4.3	5

assumed that the states join the system one years after the commencement of the scheme. The scheme will be applicable only to the new entrants in the state government service. The total number of government employees has been assumed to be 74.25 Lacs[8]. In the absence of alternative data sources on retirement rates for state government employees, the data on growth rate and retirement rate used for the central government employees has been used for the state governments also. These data are used to calculate default values of number of employees added each year in the State Government services. The state government employees are categorised as Group A , Group B, Group C and Group D employees. The percentage of total employees in each of these groups were 3.58%, 3.63%, 73.01% and 19.78%[9] in the year 2001-02 for Punjab. The same percentages are assumed for apportioning new employees in various groups for all states.

Using these numbers, and the contribution, charges and investment assumptions mentioned above, i-TAP arrives at total contributions and subsequently total accumulations of each group of central government as a whole.

[8]RBI.
[9]Economic and Statistical Organisation, Punjab.

1.7.3 Assumptions on voluntary entrants to the system

The government is expected to provide tax breaks for investments in the new pension scheme. This along with the rationalisation of returns on the existing provident fund schemes and small saving schemes of the government is likely to stimulate investment on the new pension scheme. The model assumes 50000 voluntary members to join the system. This membership has been assumed to grow at 10% per annum.