

Towards estimating India's implicit pension debt on account of civil service employees

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July 14, 2005

Abstract

Promises by the State about payment of pension in the future are much like debt. For the purpose of fiscal planning, and analysis of pension reforms, it is important to compute the “implicit pension debt” (IPD) of the country. India's IPD comes about through workers and pensioners of centre, states and defence forces, and the funding gap of the Employees' Pension Scheme (EPS). This paper offers estimates of the IPD owing to two components: central employees and state employees. The IPD associated with these two, as of late 2004, works out to Rs.1,735,527 crore or 55.88% of GDP. This is a substantial number when compared with the explicit internal public debt of the government of India at 84.86% of GDP (2004-05).

*We are grateful to Girijesh Tiwari, Sunil Kumar and Shuchi Smita for outstanding research assistance. We benefited from discussions with Anand Bordia, Sandeep Ghosh and Renuka Sane.

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1 Introduction

The traditional, defined benefit civil service pension (TCSP) scheme is unfunded – i.e. the central and state governments have an obligation to pay pensions to their employees but have not set aside any funds to meet these obligations. Government promises about pension payments to their employees at future dates are like the interest payments and repayments that have been promised on government bonds in the future. Hence, the stock of promises about pension payments in the future are akin to debt. This motivates the desire to compute the “implicit pension debt” (IPD), which shows the net present value of these future promises. The IPD is the debt of the government which is not explicitly recognised, in contrast with the stock of government bonds, which are directly visible.

IPD estimates are an important input to the current debate on India’s pension reform. From the viewpoint of fiscal planning, there is no difference between explicit debt and implicit pension debt. Estimation of IPD is hence important for understanding India’s fiscal situation.

The IPD of the Indian State may be seen as the sum of future pension liabilities for the following segments of the population:

1. *Central government*

Workers, pensioners and family pensioners drawn from:

- Defence,
- Railways,
- Post,
- Telecom,
- Civil ministries,
- Autonomous bodies, educational and grant-in-aid institutions under civil ministries,¹
- Independent departments and apex bodies,²
- Union Territories.

¹Over 220 institutions under the Central Government fall in this category. As an example, Jawaharlal Nehru University (JNU) and the Kendriya Vidyalaya Sangathan are “autonomous bodies” under the Ministry of Human Resource Development. Employees of JNU and the 900 Kendriya Vidyalayas who were recruited prior to 01 January 2004 were entitled to the traditional civil service pension (TCSP). But these pension payments are reflected on the JNU and KVS budgets and not on the Ministry of HRD budget.

²These include the Central Bureau of Investigation, Planning Commission, UPSC, CAG, National Commission for Women, SEBI, etc.

2. State governments

Workers, pensioners and family pensioners drawn from:

- Civil ministries,
- Autonomous bodies, educational and grant-in-aid institutions,³
- Local bodies, e.g. the Panchayati Raj Institutions (PRI).

3. The funding gap of the Employees' Pension Scheme (EPS)

Another component of the IPD of the Indian State is the extent of the funding gap⁴ of the Employees' Pension Scheme (EPS) of the EPFO.⁵

The total IPD of the government of India therefore reflects the NPV of future payments to existing workers, existing pensioners and family pensioners formed of all these components. At present, no IPD estimates exist, which encompass all these elements.⁶

In this paper, we offer estimates of the IPD on account of a narrow subset of all these sources of IPD. Specifically, we only address the workers associated with civil ministries, non-civil departments and their autonomous bodies, at the Centre and the States. These estimates are, of course, only a part of the overall IPD of the Indian State. However, these calculations represent an important step forward in the task of obtaining IPD estimates for the Indian State.

2 Methodology

The IPD associated with a worker is the net present value of all future pension payments to the worker. Our estimation methodology consists of the following elements:

³These include state electricity boards, state transport corporations, statutory boards, etc.

⁴The EPFO Annual Report (2003-4) shows that there are presently 28.09 million members of EPS. Recent actuarial calculations suggest that the EPS is presently underfunded by at least Rs.22,000 crore.

⁵The IPD of GOI would also include the implicit liabilities on account of other legislated PF schemes (like the Coal Miners' Provident Fund and Seamens' Provident Fund) as well as the EPF contributions being managed by exempt provident funds under the EPFO.

⁶From official sources we know that there are roughly 1 million defence employees, nearly 2 million defence pensioners, and around 2 million pensioners of central (civil) ministries, post, telecom and railways put together. We also know that a majority of defence employees retire after only 20 years of service and become eligible to a full pension for life thereafter. No official estimates exist for the number of state government pensioners and family pensioners. As no data on their age and income distribution exists, the IPD associated with these segments cannot be estimated.

- *Demographic characteristics of government employees*

Computing the IPD requires information on the number of employees at each age with their income profiles. The central difficulty in estimating the IPD for GOI in the past has been the lack of such information for both central and state government employees.

This paper was made possible by the Indian Retirement Earnings and Savings (IRES) database, 2004. This database was created through a random sample of 40,862 earners in November 2004. IRES captured primary information on central and state government employees and provided an estimate of the size of their population, as well as of their age and income distribution.

The observations of central and state government employees in IRES do not allow bins at every integer-valued year. Hence, observations were grouped in 5-year closed intervals [21, 25], [26, 30], [31, 35], [36, 40], [41, 45], [46, 50], [51, 55], [56, 60]. Observations of employees of age less than 21 and over 60 years were removed. We assume that the year of retirement of an employee in an age interval will be 2004 plus 60 less the mid-point of the age-interval. For example, an employee in age-interval [56, 60] will retire in 2006.

- *All computations in 2004 Rupees*

In the future, there will be systematic price rises, and corresponding changes in wages owing to wage indexation. This introduces non-comparability between payments at different dates. In this paper, in order to ensure comparability and to ease interpretation, *all calculations are made at 2004 Rupees*. Owing to this approach, we measure the wages of a government employee from his primary occupation as of 2004, and then assume there is no wage indexation in the future owing to inflation. Other elements of the methodology are adjusted so as to ensure that all measures are in 2004 Rupees.

- *Actuarial aspects are embedded in LIC's prices of annuities*

One way of doing IPD estimates is to obtain estimates of future mortality of each worker or pensioner. In this paper, we sidestep this issue by using the price of an immediate survivor annuity product sold by LIC.⁷ Actuarial calculations are embedded in LIC's annuity prices. We assume that GOI buys an annuity from LIC for a person at age 60, which pays a pension until death, and then pays half the pension to the spouse until his/her death.⁸

⁷As of December 2004, the LIC price of an immediate survivor annuity at age 60 is Rs.1000 for an annuity of Rs.69.90 per year.

⁸In practice, the family pension payable to government employees is 60% of the original

Table 1 Income distribution of civil servants versus full earning population

Group	Total annual income (rupees)		
	25th percentile	Median	75th percentile
Employees of GOI	60,000	84,000	120,000
Employees of States	60,000	78,000	108,000
All government employees (GOI and state)	60,000	80,400	114,000
Full population of earners	19,000	35,000	64,000

Source: IRES database, authors' calculations.

Table 2 Educational characteristics: civil servants versus others

	GOI employees	Others
Illiterate	4.16	23.47
Graduate	22.80	6.60
Post-graduate	8.51	1.11

Source: IRES database, authors' calculations.

In practice, government employees derive an inflation-indexed pension with survivor benefits. However, the LIC prices for an immediate survivor annuity considered in this paper will only provide a *nominal* annuity. The cost of purchasing an inflation-indexed annuity is likely to be much higher and hence the IPD of the GOI is likely to be understated in this paper.

Also, mortality improvements may be expected over time, leading to a higher annuity price and therefore a higher payment by the GOI than is used in this paper. To the extent that mortality improvements do take place, our IPD estimates are biased downward.

While there are documented differences in the mortality of men and women,⁹ this paper does not distinguish employees by gender. As women tend to outlive men and would draw a pension over a longer period, the IPD estimates in this paper would tend to be understated. Interestingly, LIC annuity prices are identical for both men and women at age 60, and hence our IPD estimates accurately portray the price of an annuity from LIC.

There is a subtle difficulty with IPD estimation for civil service employees, which derives from the difference between mortality as estimated using census data and the mortality of government employees. Em-

pension. The annuity price for government pensions should be higher than the price of Rs.1000 for an annuity of Rs.69.90 per year considered in our calculations. Hence, the IPD estimates will be understated.

⁹*Source:* Women and Men in India, 2002, Central Statistical Organisation, Ministry of Statistics and Programme Implementation, Government of India

ployees of GOI are much richer than the population average (Table 1) and much better educated (Table 2). Hence, they will live longer than the rest of the population. Thus, IPD calculations based on census-derived mortality rates have a downward bias. However, the customers of LIC – who shape LIC’s annuity prices – are drawn from a similar socio-economic background as employees of GOI. Hence, LIC’s annuity prices are likely to better reflect the future mortality experience of government employees as compared with actuarial calculations based on census data.

- *Future pension payments will be outsourced*

Recent studies as well as the IRES (2004) data suggest that the number of persons currently drawing a pension from the government may be significantly higher than the actual number of government pensioners and family pensioners. This highlights the administrative difficulties faced by the GOI in effectively verifying death when making pension payments. This paper estimates the IPD on the assumption that the administrative responsibility of efficiently verifying death and delivering pension payments is outsourced to insurance firms for the current stock of employees. To the extent that the GOI continues to insource pension administration and delivery, our IPD estimates are underestimated.

- *All existing employees will continue in service till age 60.*

There is a small chance that a government employee at (say) age 25 could die before age 60, and thus not enjoy a pension. In this paper, we make a simplifying assumption that there is zero mortality among government employees until age 60, so that every employee of GOI as of end-2004 will live till age 60. We also assume that all government employees will continue in service till age 60 and will draw a full pension from the government.

- *All new Central and State employees come under NPS from January 1, 2005*

All employees of the central government (except armed forces) recruited after 01 January 2004 are covered by the New Pension System (NPS). Several States¹⁰ have also adopted the same strategy for their own new employees. The dates on which the NPS is effective across these states is distributed over the last 18 months, and many States have yet to formally announce a shift to the NPS. In this paper, we

¹⁰States which have issued Notifications on adoption of NPS for their new employees include Andhra Pradesh, Chattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Madhya Pradesh, Manipur, Rajasthan, Tamil Nadu and Uttar Pradesh.

have adopted a simplifying and optimistic assumption that all recruitment by GOI and all States after 01 January 2005 will be under the NPS.

This assumption blocks the flow of new workers into the traditional civil service pension and freezes the stock of government employees eligible for the TCSP. To the extent that this assumption is incorrect, and new recruits continue to flow into the TCSP, the IPD of GOI and states will be greater.

- *Future evolution of wages*

A key element of IPD estimates is making projections for the future evolution of wages. This is done in two steps.

Wage-experience profile of workers. Employees of GOI are in four grades, “A”, “B”, “C” and “D”. The modal grade is C, as 64.26%¹¹ of employees are in grade “C”. In grade C, the wage of a person at age 60 is 2.2 times larger than the wage at age 21. This implies an average wage growth of 2% per year on account of the wage-experience profile.

Future pay commissions. Wages are revised in real terms, from time to time, through “pay commissions”. We assume that the real wage growth owing to future pay commissions is 2% per year. This is a conservative estimate, given that future GDP growth is likely to be roughly 6.5%. However, to the extent that this conservative assumption *understates* future wage growth in our calculations, it understates the size of the pension payable per worker and hence the IPD.

Putting these two elements together, our estimates involve an assumption of a 4% per annum real growth in wages of the stock of existing government employees.

- *Discounting future purchases of annuities*

Through these steps, we will be in a position to measure the price payable – at LIC rates – for pensions for government employees at future dates. These future payments need to be discounted to 2004 in order to reduce them to IPD. This discounting is done at a 2% interest rate. This is roughly equivalent to a 6% interest rate on a 30-year GOI bond, with inflation at roughly 4%.

The key assumptions are summarised in Table 3.

¹¹Source: Brochure on Pay and Allowances of Central Government Civilian Employees (2001-02), Pay Research Unit, Department of Expenditure, Ministry of Finance, Government of India

Table 3 Assumptions

Parameter	Value assumed
Date from which NPS comprehensively implemented at centre and states	1 January 2005
Age at retirement at all future dates	60 years
Impact of future pay commissions	2% real wage growth per year
Wage growth on account of wage-experience profile	2% per year
Interest rate on government bonds in real terms in coming decades	2%
LIC's price of immediate survivor annuity at age 60	Rs.1000 buys an annuity of Rs.69.90/year .

3 Central government employees (civil)

We obtain estimates of the size of the population of central (civil) employees as well as information on their demographic and income distribution using the Indian Retirement Earnings and Savings (IRES) database, 2004. Using the IRES, we project a population of 5,398,149 central (civil) employees.¹² Employees below age 21 and over age 60 have been excluded from our IPD estimations, and hence the relevant population of central (civil) employees for IPD calculations is 5,285,523. Official data on the number of GOI employees only reflects the employees of central (civil) ministries and non-civil departments.¹³

Table 4 shows the computation of IPD for central (civil) employees present as of 2004. This shows estimates of the payments that GOI would have to make to LIC, at various future dates, in order for LIC to takeover pension payment to GOI employees. These payments need to be discounted to the present in order to make the IPD. The NPV of the GOI IPD for central (civil) employees is estimated at Rs.406,092 crore.¹⁴ If, instead of using the

¹²This includes employees of central (civil) ministries, non-civil departments (railways, post, telecom and civil defence), grant-in-aid institutions and autonomous bodies including educational institutions, statutory and apex bodies. This estimate does not include employees of the Indian Armed Forces. This also excludes the 63,513 employees (Annual Union Budget, 2005-06) of Union Territories as UTs were excluded from the sample for IRES.

¹³**Corroboration:** As per the Union Budget (2005-06), there were a total of 3,435,678 employees in central (civil) service and non-civil departments as of 2004-05. Of these, 1,410,979 employees belong to central (civil) ministries, 1,467,068 employees to Indian Railways, 555,056 employees to Department of Posts, and 2,574 employees belong to the Department of Telecommunications. No official estimate exists for the number of employees of autonomous bodies, educational and grant-in-aid institutions, statutory bodies, apex institutions, etc.

¹⁴If, instead of using the 2% discount rate for calculating the NPV, we apply a discount

Table 4 IPD estimation for central (civil) employees

This table shows details of IPD estimation for central (civil) employees as of 2004. As an example, using IRES, we estimate there will be 503,992 retirees in 2006, who had a median wage in 2004 of Rs.84,000. Using our projection methods, we estimate that in 2006, each of these employees will derive a mean annual pension of Rs.45,427 per year. The LIC price of this pension is Rs.649,888. Multiplying through, we estimate that in 2006, GOI would have to pay LIC Rs.32,754 crore in order to adopt the pension payments associated with this batch of retirees. This estimate – Rs.32,754 crore – is a future value, it is a payment to be made in 2006.

Year of retirement	Number retiring	2004 wage (Rs.)	Predicted pension (Rs.)	Annuity price (Rs.)	Total cost - FV (Rs. crore)
2006	503,992	84,000	45,427	649,888	32,754
2011	727,971	80,599	53,031	758,675	55,229
2016	1,108,022	84,000	67,243	961,993	106,591
2021	951,621	84,000	81,811	1,170,412	111,378
2026	850,937	72,000	85,317	1,220,599	103,861
2031	528,436	74,563	107,495	1,534,848	81,265
2036	465,110	65,000	114,011	1,631,071	75,862
2041	149,435	36,000	76,825	1,099,079	16,424

median wage, we use a trimmed mean wage of the income distribution at each age band, the IPD rises to Rs.447,703 crore.

4 State government employees

We obtain estimates of the demographic and income distribution of state government employees¹⁵ using the Indian Retirement Earnings and Savings (IRES) database, 2004. IRES projections estimate the population of all state government employees at 18,657,887. Employees below age 21 and over age 60 have been excluded from the IPD estimations, and hence the relevant population of state government employees for IPD calculations is 18,438,515.¹⁶

rate of 4% (implying nominal returns of 8% on GOI bonds), the IPD for central government (civil) employees is Rs.293,491 crore.

¹⁵This includes the employees of ministries and departments, aided institutions including educational institutions, local bodies who draw salaries and pensions from the respective state government budgets.

¹⁶**Corroboration:** Using IRES, we estimate the total number of state government employees of all states (except Manipur) at 18,657,887. No official estimates of the total number of employees eligible for salary and pension in state governments exists. The 12th Finance Commission has estimated the total salary bill of all states at Rs.122,980 crore (2003-04) and estimated a CAGR of 12.08% from 1993-04 to 2003-04. Using this, the total salary bill in 2004-05 is projected at Rs.137,000 crore. The mean salary of state government employees as per the IRES is Rs.77,489.71. Multiplying this with the

Table 5 IPD estimation for state government employees

This table shows details of IPD estimation for all state government employees as of 2004. As an example, using IRES, we estimate there will be 1,340,895 retirees in 2006, who had a median wage in 2004 of Rs.84,000. Using our projection methods, we estimate that in 2006, each of these employees will derive a mean annual pension of Rs.45,427 per year. The LIC price of this pension is Rs.649,888. Multiplying through, we estimate that in 2006, all state governments put together would have to pay LIC Rs.87,143 crore in order to adopt the pension payments associated with this batch of retirees. This estimate – Rs.87,143 crore – is a future value, it is a payment to be made in 2006.

Year of retirement	Number retiring	2004 wage (Rs.)	Predicted pension (Rs.)	Annuity price (Rs.)	Total cost - FV (Rs.crore)
2006	1,340,895	84,000	45,427	649,888	87,143
2011	2,643,722	84,000	55,269	790,688	209,036
2016	3,181,843	78,000	62,440	893,279	284,228
2021	3,265,364	72,907	71,007	1,015,841	331,709
2026	3,356,840	72,000	85,317	1,220,599	409,722
2031	2,372,499	62,000	89,384	1,278,747	303,382
2036	1,570,199	56,029	98,276	1,405,958	220,763
2041	706,949	41,244	88,016	1,259,174	89,017

Table 5 shows the computation of IPD for state government employees present as of 2004. This shows estimates of the payments that the states would have to collectively make to LIC, at various future dates, in order for LIC to takeover pension payment. These payments need to be discounted to the present in order to make the IPD. The NPV of the IPD for all state governments is estimated at Rs.1,329,435 crore.¹⁷ If, instead of using the median wage, we use the trimmed mean wage the income distribution at each age band, the IPD rises to Rs.1,405,036.84 crore.

5 Conclusion

Table 6 summarises the results of this paper. We have obtained estimates for two out of the seven components of the IPD of the Indian State. These

IRES estimate of the number of state government employees (18,657,887) gives us a total salary bill of Rs.144,584 crore (2004-05). This is 5.5% more than the total salary bill of states estimated from the 12th Finance Commission data. Importantly, the 12th Finance Commission's estimate of the total state government salary bill does not include salaries of local bodies and aided educational institutions of Gujarat, Nagaland and Goa. Also, the 12th Finance Commission does not provide any salary details for Jammu & Kashmir and Delhi as well as the bill for aided institutions of Mizoram.

¹⁷If, instead of using the 2% discount rate for calculating the NPV, we apply a discount rate of 4% (implying nominal returns of 8% on GOI bonds), the IPD for state government employees is Rs.949,127 crore.

Table 6 Summarising estimates

Component	Implicit Pension Debt	
	Rs.crore	As % of GDP
1. Central civil employees	406,092	13.08
2. Central civil pensioners		
3. Central defence employees		
4. Central defence pensioners		
5. State civil employees	1,329,435	42.81
6. State civil pensioners		
7. Funding gap in EPS		
Total		

two sum up to an IPD of Rs.1,735,527 crore or 55.88% of GDP.¹⁸ This is a substantial value, when compared with the explicit internal public debt of GOI, which stands at 84.86% of GDP (2004-05).¹⁹

Accurate estimates of India's IPD, both at the national level and at the state level, are important for the purpose of fiscal planning and pension reforms. Further work is needed in building databases for deriving the IPD for individual states, and the remaining five components (defence workers and pensioners, central civil pensioners, state level pensioners, and the funding gap in EPS). Further work is also needed to sharpen the estimates made in this paper.

¹⁸GDP at market prices is estimated at Rs.3,105,512 crore in 2004-05.

¹⁹Source: Centre for Monitoring Indian Economy.