Annuities Market in India: Rationale, Structure and Challenges

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Abstract

India needs to develop robust annuities markets to enable its ageing population to address longevity risk; meet the retirement needs of its large and growing informal sector workers; and to satisfy the mandatory annuity requirement of the New Pension Scheme. The huge potential demand for annuity-type products in India needs to be matched by appropriate supply responses from the industry of annuity providers. This paper argues that developing a market for annuities will require disaggregated morbidity and mortality databases at the national level for better price discovery; supply of a variety of financial assets for better matching of assets and long-term liabilities; innovations in annuity products and distribution channels; greater financial literacy, and more robust regulation.

Key Words: Annuities, Pension Reform, India, Phased Withdrawals.

1. Introduction

National pension systems address longevity and inflation risks in various ways[1]. For the most part, the OECD countries rely on social insurance principles applied on universal basis to address longevity risk. Inflation risk is addressed in different ways: some countries apply price or wage indexation to pensions, while others rely on ad-hoc increases in pension amounts.

In many developing countries, including India, social insurance principles on universal basis are not prevalent. An important reason is the fairly low coverage of formal pension systems. Typically, only the armed forces, civil servants and some private sector employees have access to pensions. As a result longevity and inflation risks are mitigated only for a small proportion of the labour force. The five tier pension framework proposed by the World Bank recognizes that a social pension or at least social assistance is essential for the lifetime poor, who may constitute as high as 30 per cent of the total labour force in India[2]. Social pensions and social assistance are also a form of social risk pooling as their financing is from government budgets.

An annuity is an insurance product involving periodic payments during retirement that addresses longevity risk and in some cases, limited inflation risk. It may also provide income security for the survivors. Annuities may be purchased on a deferred basis, i.e. purchase takes place during the working years; at the time of retirement; or within a specified time after retirement. As the pay-out phase is usually long and uncertain, annuities require matching of assets and liabilities over a fairly long period. This is even more relevant when deferred annuities, rather than immediate annuities are purchased[3]. There are many types of annuities; and an annuity product is normally priced on the basis of product features as well as interest rates and other economic variables. Affordability of annuity products is thus an important public policy consideration.

This paper is structured as follows. Section 2 discusses the rationale for developing robust annuities markets in India. This is followed by an overview of the annuity markets in India, focusing on various types of annuity products and providers in Section 3. Key challenges in the development of annuity markets in India and reform directions are discussed in Section 4. The final section provides concluding remarks.

2. Rationale for developing robust annuities markets

There are several reasons why India must develop robust annuities markets.

First, India is experiencing a demographic transition, chiefly characterized by declining fertility rate and increased life expectancy (Table 1). Since people have fewer children but live much longer than before, the population of India is ageing rapidly. Projections by the Population Foundation of India indicate that the proportion of population over 65 years that may be classified as retired will rise to 8 per cent in 2031, and over 13 per cent by 2051. In absolute terms, the number of persons aged 65 and above will rise from 62.5 million in 2011 to 121.8 million in 2031, and to about 229.4 million in 2051[4]. Since there are vast inter-state variations in fertility rate, states such as Kerala and Tamil Nadu, which have below-average fertility rates are expected to age earlier than other states[5].

Both the level and the pace of ageing are likely to provide significant challenges. Life expectancy at 60 years was expected to be 17.5 years in 2001; by 2006, it had been revised upward to 19 years[6]. Longevity is expected to increase further, particularly for the salaried middle and upper class with access to superior education and health facilities. Uncertainty in longevity trends is however complicating the task of pricing annuities in India.

The combination of lower fertility and higher life expectancy creates longevity risk, or the risk that retirees will outlive their savings. Traditional family structures addressed longevity risk by providing for the financial needs of dependents through the income of earning members of the family. Frequent mobility of labour and migration from rural to

urban jobs has broken down traditional extended families, and created nuclear family units in which individuals are expected to be self-reliant in providing for their retirement needs.

Second, rising old-age dependencies have forced a global shift from Defined-Benefit (DB) Schemes to Defined Contribution (DC) Schemes[7]. Population ageing in Asia has not been as significant as in advanced countries so far[8], but by 2050, old-age dependency ratios in Asia are expected to reach US-levels[9] (Table 2). There is substantial diversity in ageing trends within Asia; for instance, India's demographic profile will remain favorable longer than other emerging Asian countries.

Despite the relatively slower pace of ageing, India will find it increasingly unsustainable to maintain and expand its existing DB schemes. There is a worldwide trend in shifting from DB to DC schemes not just due to increasing longevity but also as a result of changing labour market and economic conditions. For private sector workers, who are no longer expected to have lifetime employment with the same employer and plan sponsor, a portable DC scheme offers more flexibility and benefits than a DB plan. There has been a dramatic shift from DB to DC plans in the private sector in the US. In 2007, only 14 percent of workers in the private sector were covered by DB plans; whereas 64 percent had DC plan coverage[10].

DB Pension schemes of civil servants in India are also not sustainable. Central and state government budgets are already burdened with large fiscal deficits (combined overall fiscal deficit is expected to be about 10 percent of GDP in 2008-09). Consequently they are not expected to have the resources to address the retirement needs of such vast numbers of elderly people. The recent adoption of Fiscal Responsibility and Budget Management (FRBM) Acts by the Centre and several states may result in further expenditure contraction and debt curtailment[11]. Thus state-financed income support will reduce significantly in the future, but elderly retired persons will need income support for longer periods of time.

Third, it is estimated that India will need to create 140 million jobs between 2005 and 2020, nearly 30% of the world's total[12]. Most of the new jobs will be in the informal sector (ILO, 2008). Many of the informal sector workers will have some ability to save for their retirement, thus generating a demand for annuities[13]. These workers require avenues for retirement saving which generates reasonable market-based returns and in which they have confidence.

Fourth, the effectiveness of the New Pension Scheme (NPS) launched in 2004 depends critically on the existence of a well-developed market for annuities. NPS is designed as a Defined Contribution (DC) system of individual pension accounts jointly funded by the employer and employee; each of whom is required to contribute 10 per cent of gross salary. Members can select a pension fund manager and allocate funds to an investment scheme of their choice. A key feature of the NPS is that withdrawals are not normally permitted until the age of 60. At retirement, accumulated balances are divided into two components. At least 40 per cent of the account balance has to be mandatorily used for purchasing annuities; the remaining can be withdrawn as a lumpsum amount. Investors have the flexibility to leave the scheme before attaining the age of 60, but in that case they are required to annuitise 80 percent of their accumulated balances. Thus it is expected that there should be a variety of competitively priced annuity options to suit the retirement needs of different members.

The NPS is mandatory only for central government workers, but nineteen state governments have already adopted it for their employees. Moreover, plans to extend the NPS to any Indian citizen who wants to subscribe to it on a voluntary basis are at an early stage of implementation. Therefore, the reach of NPS is potentially very large. As membership of NPS grows, the number of persons with requirements for annuitizing is likely to increase phenomenally[14].

Annuities are relevant even for those who do not participate in the NPS. Many self employed professionals and small business owners would find annuity products useful in managing retirement risks. In addition, micro-pension schemes, which are expected to

have a limited but important function in providing retirement income, also need to address payout options, including annuities[15].

Clearly, the potential demand for annuities is large. However, the market for annuities is not well developed; and does not have the depth or volumes that will be necessary to efficiently administer annuities for future retirees.

Policy makers will need to focus on creating improvement in actuarial data and demographic data, innovation in marketing of annuities through adoption of new distribution channels and technological advances, efficiencies in investment management and introduction of suitable investment instruments, and increase in overall financial literacy in order to facilitate greater spread of annuities.

3. Annuity Markets in India: An Overview

Annuities may be classified on the basis of the type and periodicity of payouts, as well as by additional benefits attached to the annuity stream (Figure 1). Thus, payouts commence immediately after the purchase of an immediate annuity; but start at prescribed future date in case of a deferred annuity. The payout may be made as a single lumpsum, or fixed periodic amounts, or variable amounts that are linked to an underlying index of assets or prices. Payouts may cease after a specified period, continue for the duration of the annuitant's life, or pass on to nominated survivors at a reduced rate.

The intrinsic annuity product can be improved by adding other benefits for the annuitant. For instance, inflation indexed annuities address inflation risk by maintaining, partially or fully, the real value of future payouts. Variable annuities offer investors flexibility to exercise some choice over the underlying assets, in return for riskier and non-fixed income streams. A relatively new class of annuities has developed in markets such as USA, UK and Australia to cater to those with reduced lifespan. These are enhanced annuities, which provide enhanced payouts to high-risk lives; and impaired annuities,

which pay substantially higher amounts to individuals with proven serious medical conditions[16].

Thus annuities can be created across the risk spectrum; ranging from basic ones to instruments that expose a retiree to higher risk and provide higher incomes, and those that combine survivor and other benefits. An annuity is thus like any other product where design and price discovery are important.

There are 22 life insurance companies, of which 21 are in the private sector, who provide annuities in India (see Table 3). The Life Insurance Corporation of India (LIC) is the sole annuity provider in the public sector, and is the market leader. According to data released by the Insurance Regulatory and Development Authority (IRDA), of the 3.2 million general annuity and pension plans in force in March 2007, about 2.9 million, or 91 percent, were written by LIC[17].

Annuities constitute a relatively small segment of the insurance sector[18]. Recent trends suggest that life insurance products are the most important in terms of volume as well as premiums generated, but there has been a sharp rise in purchase of pension policies. A dis-aggregation of first year premiums underwritten during 2006-07 shows that annuity products contributed only 2.62 % of the total premium underwritten, whereas life insurance and pension products contributed 67.4% and 29.94 % respectively[19]. Pension products are relevant during the accumulation phase, when they facilitate regular savings for the purpose of providing for retirement. At retirement or the vesting stage, the holder of a pension plan has the option to purchase one of several annuity options[20]. Thus the rising demand for pension products can potentially translate into higher demand for annuities in the future.

The supply side of the market has witnessed substantial product innovation. For instance, almost all insurers now offer joint life annuities, which provide survivors' benefits[21]; and increasing annuities, which are designed to at least partially mitigate the impact of inflation on annuity streams. Deferred plans are available to allow individuals to choose

the age from which they wish to receive annuity streams; such plans may be viewed as savings cum annuity products. Annuities that return the initial capital on the death of the purchaser within a specified period are widely available. Each product innovation, however, impacts on the premium for the investor; but permits variety of risk-management preferences to be addressed from the perspective of the consumer. Annexe I highlights some of the annuity products offered by a sample of insurance companies in India.

Typically, Indian insurance companies offer an 'open market option' that permits investors in pension accumulation plans to shop for the best annuity provider at the time of vesting. This practice promotes competition and transparency in the market.

Annuity demand is typically low even in markets such as UK where compulsory annuitisation norms have resulted in better understanding of the benefits of annuitisation[22]. The observed 'annuity demand puzzle' reflects a clear preference to retain some or all pension wealth in non-annuity forms. Several reasons have been advanced in the literature for this phenomenon.

Annuities markets suffer from an adverse selection problem - created by the tendency of those who do not expect to live long to avoid buying annuities, thus limiting the pool to customers with substantial longevity risk. Since individuals have private information about their life expectancies that may not be available to the insurance company, there is a tendency for those with higher expected life expectancies to be more motivated to purchase annuities. On the supply side, the prevalence of asymmetric information in the annuity market makes its pricing more complex. The outcome is that buyers often perceive annuities as being overpriced.

Annuities are usually illiquid, so annuitants forfeit the option to liquidate and exit in case of unforeseen expenditures. This inherent inflexibility may deter retirees who desire greater control over their consumption decisions. Further, unlike traditional fixed income assets, basic annuities do not return the initial principal used to purchase an annuity; so

that annuities do not enable individuals to leave a bequest[23]. If annuities are not mandatory, retirees tend to opt for higher-return instruments such as bank deposits and small savings instruments. However, if annuity returns are made relatively attractive and its benefits are better understood, demand may increase.

3. Key Challenges in India

1. Actuarial issues

India is experiencing sustained improvement in longevity, though its speed and extent remains uncertain[24]. Given India's vast heterogeneity among different ethnic and occupation groups, annuity providers face considerable challenges in pricing different annuity products. Life insurance companies, the only ones authorized to provide annuities, rely on standardized mortality tables to estimate this variable. The common industry standard is LIC's computation of Ultimate Mortality Rates of Annuitants (1996-98) (Annex II), which has increasingly become unsuited for the following reasons.

First, the mortality rates used for longevity prediction were calculated nearly a decade ago, during which advances in health facilities, nutrition and overall income levels are certain to have improved life expectancy at retirement. Further, the Table is based on mortality of occupational pensioners- a group of relatively better-off salaried individuals- who are likely to have higher life expectancy as compared to those who are not eligible for occupational pensions. Since annuity providers realize that price calculations based on underestimated life expectancies would result in underpriced annuities, they have an incentive to mark-up their prices to cover the probability that the annuitant would live considerably longer than predicted.

Second, these tables do not adjust for variations in mortality across different population groups, such as men and women; urban and rural dwellers; and unskilled and highly educated labour. For instance, women tend to live longer than men: on attaining 60 years, women have a life expectancy of over 17 years, whereas men are expected to live for only another 15.7 years. Applying uniform rates across persons with different longevity

risks distort the demand for annuities in two ways. Workers with low expected longevity will be priced out of the market, thus reducing the number of retirees who voluntarily opt for annuities. Further, if purchase of annuities is mandatory, there will be a perverse transfer of resources from low risk (short lived) to high risk (long lived) investors.

Miscalculation of longevity trends can seriously impair an insurance company's profits; hence they must take the initiative to address the gaps in actuarial data. As mortality and morbidity tables and their subsequent maintenance is a semi-public good, industry will need the support of the government in the creation of such databases, particularly in the initial stages. Availability of sound data will enable better price discovery in the annuities market.

2. Marketing of Annuities

The marketing and distribution of annuities, like all insurance products, depends heavily on insurance agents. Individual agents underwrote nearly 86 per cent of the total new life business underwritten in 2005-06; corporate agents (such as banks) underwrote about 9.5 percent; and referrals, brokers and direct business accounted for the remaining. Individual agents are a critical customer interface point for the insurance industry, and play a key role in influencing the final purchase decision. Therefore they need to be trained to disseminate knowledge about the benefits of annuities.

The present incentive structure for agents is skewed in favour of non-annuity insurance products. A life insurance agent earns a commission of 2% of the initial amount on a single premium annuity product. On annuities with periodic premium payments, the commissions allowed are 7.5% of premium paid in the first year and 5% of premiums paid in subsequent years. In contrast, a typical whole life endowment policy enables an agent to earn a premium of 25% of the first year's premium; 7.5% of the second and third year's premiums paid, and 5% thereafter until maturity. The large differential in commissions earned increases an insurance agent's incentive to promote non-annuity products. The solution to this anomaly does not lie in increasing commissions- a step that

would ultimately increase costs to the annuitant- but rather, in tapping other low-cost, technology-intensive marketing avenues.

Establishment of alternate innovative distribution channels will further develop the market. For instance, multi-level marketing processes or internet based sales could be developed as additional distribution models[25]. The development of several distribution channels will enhance annuity penetration, improve awareness of retirement financing instruments and facilitate competition. As annuity markets grow, it may be useful to set up a nation wide electronic system for comparing standardized annuity rate quotations from different providers. India's experience with nation-wide electronic platforms for such as the National Stock Exchange of India, and the resulting improvement in transparency and lowering of trading costs, provides a sound precedent for annuity markets. An electronic bidding system for annuity quotes is operating successfully in Chile and allows individuals to make more informed choices[26].

3. Phased Withdrawals

Annuity like products such as phased withdrawals should also be developed by the industry. Phased withdrawal products- in which accumulated sums remain invested in an individual's retirement account until withdrawn in phases- are often preferred to annuities because the funds are not transferred into a common risk pool. This option is particularly attractive to those with relatively small balances (in the Indian context, less than Rs.5 lakh capital sum in 2007 prices); and for those who do not anticipate a long post-retirement life. Phased withdrawal products could be a possible investment option for the lumpsum portion of savings accumulated under NPS. Phased withdrawal arrangements could also be incorporated into the design of small savings schemes[27].

Some evidence of the rationale of allowing phased withdrawals is available from the experience of Chile, where workers have to mandatorily opt for annuities or programmed (phased) withdrawals on retirement. It has been found that about two-thirds of workers chose to annuitize, and phased withdrawals are more prevalent among workers with lower incomes and savings[28].

Phased withdrawal would require careful design. The design has to ensure that the consumer does not outlive his pension savings. It would need to address the tax authority concerns that consumers do not excessively defer withdrawal to avoid taxes[29]. A multi-tier social security system would assist in addressing the possibility that phased withdrawals may end even while the person requires retirement support. India should strengthen social pensions and social assistance schemes to address this issue.

4. Inflation risk

Annuity payouts may continue for 20 years or more after retirement, and if they are fixed only in nominal terms, inflation may lead to a steady erosion of value. Increasing longevity compounds the cumulative impact of even low inflation rates[30]. Inflation losses are particularly damaging for retirees because they may not be able to make up by increasing their earnings or saving power.

Current annuity options in India only partially address inflation risks. For instance, SBI Life offers payouts with annual increments of 1%, 2% or 3%, but since inflation is usually around 5 per cent, these are not likely to hedge inflation risk fully. These annuities simply provide fixed guaranteed annual increases to pay-outs, the cost of which has to be borne by the annuitant. The insurer does not bear any inflation risk. Appropriate inflation linked annuites would require index bonds to be issued by the government.

Annuity suppliers are averse to issuing inflation-indexed annuities because of the absence of inflation hedges in the market. Thus a limited issuance of inflation-indexed bonds, which are not available in India, may allow annuity providers to manage inflation risk more successfully. The complete absence of indexed instruments may create incentives for annuity providers to hedge against inflation by investing in riskier assets such as real estate, equity or high-return derivatives; or charge higher rates for taking on inflation risk.

5. Market Risk

Market risk refers to the possibility of earning lower-than-expected returns due to adverse changes in asset prices (interest rates, exchange rates, equity prices, real estate prices) that during the term of the products. Annuities are long term financial instruments and are consequently subject to higher market risk than short duration products.

The most challenging issue for annuity underwriters is to match annuity-related liabilities with an appropriate pool of long term investments. Since most annuity payouts tend to be fixed and guaranteed at purchase, annuity providers invest predominantly in long term corporate bonds and government securities.

An adequate float of bonds with maturities of at least 10 years would be necessary to address asset-liability mismatches of annuity issuers in India[31]. Currently the long term debt market is limited to infrequent issues of long term government debt, and insurance companies that sell life annuities are substantially invested in assets with maturities lower than their future annuity liabilities. As a result annuity providers are exposed to re-investment risk, and are likely to safeguard their position by assigning a higher pricing to annuities. Recently, in recognition of the serious reinvestment risk faced by insurance companies, the Insurance Regulatory Development Agency (IRDA) has requested the finance ministry to increase the supply of long dated government debt[32].

The mandatory annuitisation regulation of NPS will result in a steep growth in annuities in the future as the present cohort of members reach retirement. As a result, disproportionate proportions of liabilities of the life insurance companies, in India would be in the form of annuity products. To avoid asset-liability mismatch, asset portfolios would need to be adjusted accordingly. Thus the creation of a large pool of long-term assets, at least partly indexed to inflation, would be critical to sustain the growth of annuities.

The present global economic crisis has increased the market risk of annuities. The resulting steep decline in equity markets in India[33] has emphasized the need for insurance

companies to find alternative investment avenues that can provide sustained returns along the lines of equity.

6. Annuitisation age

Annuity returns are a function of prevailing interest rates at the time of annuity purchase, which in turn depend on the macro-economic and market conditions. Thus two persons retiring at different times with same accumulated savings may earn different returns from the same annuity scheme interest rates. A recent study estimated that owing to the financial crisis and global slowdown, US retirement accounts lost $2 trillion between mid-2007 and September 2008, forcing many older workers to work longer hours or put off retirement[34].

If the purchase of annuities at the time of retirement is mandatory, then annuitants forfeit the option to defer the purchase of annuities until rates are favourable. This provision may significantly reduce the incomes available to those who retire during periods of economic downturns and low interest rates. In order to mitigate this risk, retirees could be permitted to hold the annuity portion in their retirement accounts until market conditions are favorable; and compulsorily annuitise by, say, the age of 70[35]. However, retirees are likely to need professional advice on timing the market; and PFRDA will have to play an important role in educating and guiding investors particularly in the early stages of development of the annuities market.

7. Financial education and literacy

The need for financial education and retirement planning information for investors as well as pension advisors, distributors and employers is critical[36]. PFRDA and IRDA, in association with employers and insurance companies, must ensure that annuity purchasers have access to information about the benefits and costs of different schemes and providers. Improved financial literacy has been observed to lead to greater participation as well as higher average saving in other countries[37].

4. Concluding Observations

There are several reasons why India needs to urgently develop a robust annuities market to address the longevity risk issues of its rapidly ageing population. The experience of countries with developed pension systems suggests that annuity options have to be carefully designed to successfully manage inflation and market risks. The products have to be distributed and marketed through innovative channels, and consumers have to be made aware of the benefits of annuities. Increasing financial literacy will be critical to improving the demand for annuities.

India needs to strengthen its social pensions and social benefit schemes to provide retirement support to those sections of the population for whom it may not be viable to purchase annuities. Different ways in which phased withdrawals may be structured, without formal annuity purchases need to be given much greater consideration in the design of NPS.

The present global economic crisis has increased the market risk of annuities. The resulting steep decline in equity markets in India has emphasized the need for insurance companies to find alternate investment avenues that can provide sustained returns along the lines of equity.

Table 1 Labor Force and Demographic Indicators

	Indicator	Time Period	
1	Life Expectancy at Birth (Years)	2007	68.59
	Male	2007	66.28
	Female	2007	71.17
2	Life Expectancy at age 60 (Years)	2001	
	Male		15.7
	Female		17.1
3	Total Fertility Rate *(No. of Children)	2000	
		2007	2.79
4	Population (million)	2001	1028
	Females (million)		496
	Males (million)		532
	Sex Ratio (Females per thousand males)		933
5	Population above age 60 (million)	2005	84.6
		2050	335.5
6	Total Work Force (million)	2001	424.6
	Urban Work force (million)		97.7
	Rural Workforce (million)		326.9

Notes:

* Total Fertility Rate is defined as the average number of live childbirths over a woman's lifetime

Sources:

1. CIA World Factbook, data downloaded from www.cia.gov
2. Adapted from Liebig and Rajan (2004), P.20, Table 4
3. State of World Population, UNFPA, 2007
4. Census of India 2001
5. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2005 Revision, http://esa.un.org/unpp
6. Census of India 2001

Table 2: Age Profile of Populations of Selected Regions

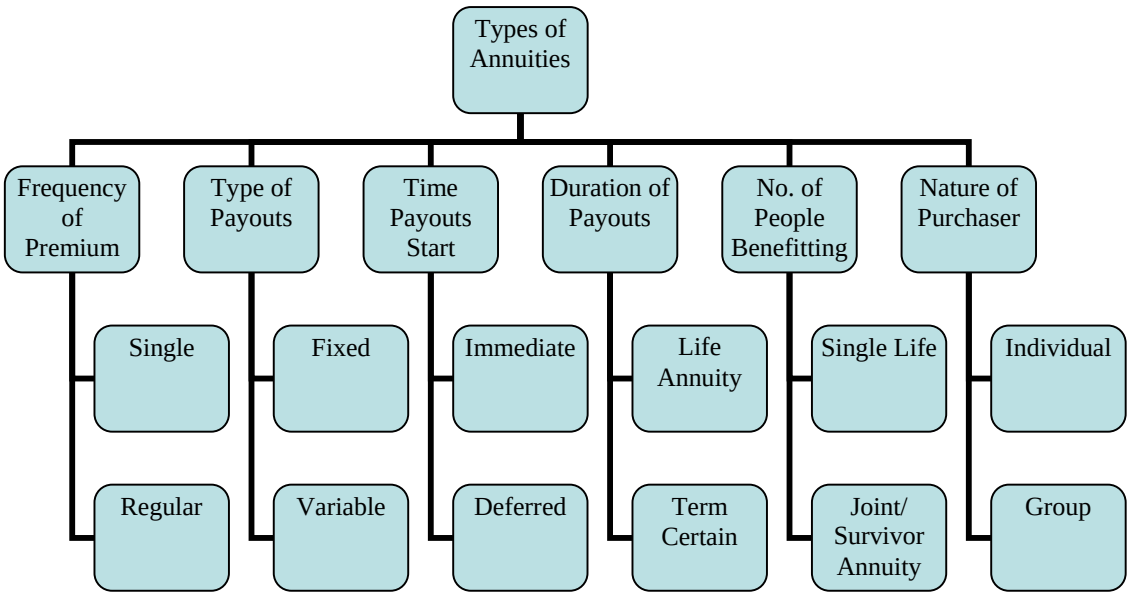
	0-14 years		15-64 years		65+ years	
% of population	**2005**	**2050**	**2005**	**2050**	**2005**	**2050**
World	28.3	19.8	64.4	63.9	7.3	16.2
Asia	28	18	65.6	64.5	6.4	17.5
USA	20.8	17.3	66.9	61.7	12.3	21
South East Asia	29.3	17.9	65.2	64.5	5.4	17.6
China	21.6	15.3	70.7	61	7.7	23.7
Japan	13.9	11.3	66.4	51.1	19.7	37.7
India	33	18.2	62	67.3	5	14.5

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision, downloaded from http://esa.un.org/unpp on December 8, 2008

Table 3: Life Insurance Companies in India

	Private Sector
1	Bajaj Allianz
2	ING Vysya
3	Reliance Life
4	SBI Life
5	Tata AIG
6	HDFC Standard
7	ICICI Prudential
8	Birla Sunlife
9	Aviva
10	Kotak Mahindra Old Mutual
11	Max New York
12	Met Life
13	Sahara Life
14	Shriram Life
15	Bharti Axa Life
16	Future Generali Life
17	IDBI Fortis Life
18	Canara HSBC OBC Life
19	Aegon Religare
20	DLF Pramerica
21	Star Union Daichi
	Public Sector
22	LIC

Figure 1: Types of Annuities



Source: Adapted from Swiss Re Economic Research and Consulting, 2006

Annexe I: Annuity Products Offered in India

Annexe II: Mortality Tables and Life Expectancy Calculations

Mortality for Annuitants - LIC (a) (1996-98) Ultimate Rates			
Age (x)	**Mortality rate (q_x)**	**Age (x)**	**Mortality rate (q_x)**
20	0.000919	71	0.02741
21	0.000961	72	0.030862
22	0.000999	73	0.034656
23	0.001033	74	0.038793
24	0.001063	75	0.043272
25	0.00109	76	0.048093
26	0.001113	77	0.053257
27	0.001132	78	0.058763
28	0.001147	79	0.064611
29	0.001159	80	0.070802
30	0.001166	81	0.077335
31	0.00117	82	0.08421
32	0.00117	83	0.091428
33	0.001171	84	0.098988
34	0.001201	85	0.106891
35	0.001246	86	0.115136
36	0.001308	87	0.123723
37	0.001387	88	0.132652
38	0.001482	89	0.141924
39	0.001593	90	0.151539
40	0.001721	91	0.161495
41	0.001865	92	0.171794
42	0.002053	93	0.182436
43	0.002247	94	0.193419
44	0.002418	95	0.204746
45	0.002602	96	0.216414
46	0.002832	97	0.228425
47	0.00311	98	0.240778
48	0.003438	99	0.253473
49	0.003816	100	0.266511
50	0.004243	101	0.279892
51	0.004719	102	0.293614
52	0.005386	103	0.307679
53	0.006058	104	0.322087
54	0.00673	105	0.336836
55	0.007401	106	0.351928
56	0.008069	107	0.367363
57	0.00871	108	0.383139

58	0.009397	109	0.399258
59	0.01013	110	0.41572
60	0.010907	111	0.432524
61	0.011721	112	0.44967
62	0.01175	113	0.467159
63	0.01212	114	0.484989
64	0.012833	115	0.503163
65	0.013889	116	0.521678
66	0.015286	117	0.540536
67	0.017026	118	0.559737
68	0.019109		
69	0.021534		
70	0.024301		

Source:
http://www.actuariesindia.org/Publication%20and%20Library%20Facility/Publication/mort_annuity_04.html

Suppose qx denotes the mortality rate at age x. The above table lists qx for x ranging from 20 to 118. The mortality rate, qx, is the probability that a person aged x will die in the year x to x+1. So (1-qx) is the probability that person aged x would survive to age x+1. For example, the mortality rate at age 60, q60 equals 0.010907; and (1-q60) equals 0.989093. This implies that there is a 98.9% probability that a person aged 60 will survive to age 61.

Let tPx denote the probability of an individual aged x surviving to age x+1. In that case Expectation of life at age 60 is : 1P60 + 2P60+3P60+..... w-60P60, where w is the last age in the table.

1Px = (1-qx)
2Px = (1-qx) (1-qx+1)

So expectation of life at age 60 is : [(1-q60)] + [(1-q60) (1-q61)] + [(1-q60) (1-q61) (1-q62)] +.....[(1-q60) (1-q61)...(1-w-60q60)].

Following the above procedure, expectation of life at age 60 (assuming maximum life is 100 years) works out to be 20.65 years.

References

Asher, M., 2008, "Social Security Reform Imperatives in Developing Asia", The Indian Economic Journal, Volume 56, No.1, April-June 2008

Asher, M. and D.Vasudevan, 2008, " Time to further rationalize small savings schemes", DNA, February 6, 2008

Asher, Mukul G. and Vasudevan, D. (2008), "Lessons for Asian Countries from Pension Reforms in Chile", PIE discussion paper No.381 series, Hitotsubashi University. Downloadable from http://www.ier.hit-u.ac.jp/pie/stage2/Japanese/discussionpaper/dp2008/dp381/text.pdf

Asher,M. and S.Shankar, 2007, "Time to Mainstream Micro-Pensions in India", Pravartak, Volume II, Issue 3, April-June 2007

Barr, N. and P.Diamond, 2008, Reforming Pensions: Principles and Policy Choices, Oxford University Press

Boivie, I and B.Almeida, 2008, "Asset Allocation Patterns in DB and DC Plans", Issue Brief July 2008, National Institute on Retirement Security. Downloaded on January 16, 2009 from www.nirsonline.org/storage/nirs/documents/Patience%20is%20a%20Virtue.pdf

Cannon, E. and I.Tonks, 2006, "Survey of Annuity Pricing", Research Report No.318, Department of Work and Pensions, U.K. Downloaded on December 2, 2008 from http://www.dwp.gov.uk/asd/asd5/rrs2006.asp

Dave, S.A., 2006, "India's pension reform: A case study in complex institutional change", CMIE Bombay, March 8. Downloaded from www.cmie.com

Holzman, R. and R.Hinz, 2005, Old Age Income Support in the 21st Century, Washington, D.C.: The World Bank

ILO (2008), "Global Employment Trends", available at http://www.ilo.org/public (accessed on Feb 1 2008)

James, E. and Sane, R. (2003), The annuity market in India: Do consumers get their money's worth? What are the key public policy issues?, in A. Bordia & G. Bharadwaj, eds, 'Rethinking pension provision for India', Tata McGraw Hill, chapter 7, pp. 231–262

Liebig, P.S. and S.Irudaya Rajan (ed.), 2003, "An Aging India: Perspectives, Prospects and Policies," USA: Haworth Press

Pejawar,A., 2008, " Distribution Channels", Paper presented at Insurance Summit 2008, National Insurance Academy, January 10.

Rocha, R. and C.Thorburn, 2007, "Developing Annuities Markets- The Case of Chile", Directions in Development, World Bank, Washington, D.C. Downloaded on December 17, 2008 from http://www.economia.unam.mx/biblioteca/Pdf/BM/libre/developing-annuities.pdf

Swiss RE, 2007, "Annuities: A Private Solution to Longevity Risk", Sigma, No.3.

Websites

Life Insurance of India: http://www.lifeinscouncil.org

Insurance Regulatory and Development Authority: http://www.irdaindia.org/

Census of India 2001: http://www.censusindia.gov.in

ICICI Prudential Life Insurance: http://www.iciciprulife.com

SBI Life Insurance: www.sbilife.co.in

Birla Sun Life Financial Services: www.birlasunlife.com

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1 Longevity risks concerns the probability that accumulated savings and retirement benefits may be inadequate to last until death. Inflation risk concerns the probability that value of retirement benefit may not be protected against inflation during the retirement period.

[2] Holzman and Hinz(2005).

[3] In India, the insurance industry has divided deferred annuities into two phases from the risk management perspective- accumulation phase and payout phase – with possibly different providers of these two phases.

[4] The population projections in the study were made for two different assumptions of Total Fertility Rate (TFR) in the future. Scenario A assumed that that states with higher current TFR would decline to the "replacement level" of 2.1 children, and Scenario B assumed that TFR would decline to 1.85 children, close to the levels observed in states such as Kerala. Both Scenarios are consistent with the goal of India's National Population Policy 2000, that fertility will decline to the point where, on an average, there are two children per family. The data quoted in this paper are based on Scenario B and are therefore more optimistic.
Source: "The Future Population of India: A Long Range Demographic View", Population Foundation of India and Population Reference Bureau, August 2007, Downloaded on December 3, 2008 from http://www.popfound.org/Population%20Projection%20PFI_PRB.pdf

[5] The Study cited in endnote 1 projects that the proportion of population aged 65 and above would exceed the proportion of population aged 0-14 by 2041 in Kerala and by 2051 in Tamil Nadu.

[6] This is based on an extrapolation of Census data. We are grateful to Mr.Subhedar for providing this information.

[7] Defined Benefit Schemes indicate benefits to be provided, but leave the contribution rate undefined; the risk of earning enough to pay out the benefits is borne by the plan sponsor. Defined Contribution schemes

have defined contribution rates but final benefits are not known; investment risks are borne by the contributor.

[8] The exception is Japan, where ageing trends have been comparable to advanced countries in Europe and North America .

[9] World Population Prospects: The 2006 revision population database, downloaded on December 8, 2008 from http://esa.un.org/unpp/p2k0data.asp

[10] Source: Boivie and Almeida (2008). In terms of dollar value of assets held in 2007 by US retirement plans, public retirement plans held assets worth $3.1 trillion; private DB and DC plans put together held $5.8 trillion of assets.

[11] The goals of the FRBM Act however remain vulnerable to populist pressures to spend on unproductive and ineffective social programs.

[12] Estimates of the Economist Intelligence Unit (EIU)

[13] A significant minority of these workers will however be life-time poor. They will need to rely on social assistance programs whose effectiveness and viability will depend of fiscal position and efficient delivery of government services.

[14] The issue of whether NPS should contain mandatory annuitization provision is discussed later in the chapter.

[15] Asher and Shankar (2007).

[16] Detailed explanation about types of annuities; and the benefits of each, as well as factors affecting annuities may be obtained from the information resource website of Pension Annuity Advisory Service at http://www.pension-annuity.co.uk/.

[17] This data has to be interpreted carefully. When a consumer buys a pension product, he buys an accumulation product and it is counted as "pension". When this pension product vests, there being no guarantees and with the possibility of annuity provider being different, it is counted as annuity.

[18] At present, data on number of annuities outstanding is not available in India.

[19] Source: IRDA Annual Report 2006-07.

[20] Most pension plans do not require the holder to annuitise the entire corpus; instead, upon vesting, the holder has the option to withdraw part of the proceeds as a lumpsum.

[21] These are vital as women as a group live longer but have lower exposure (and remuneration) from labour market activities.

[22] The compulsory annuities market is estimated to be 10 times the size of the voluntary annuities market. The profile of a typical annuitant in the two markets is vastly different: a purchaser of a voluntary annuity is likely to be female and around 70 years of age whereas the average compulsory market annuity purchaser would be male and around 65 years. Source: Cannon and Tonks (2006).

[23] The desire to bequeath has been addressed by annuities that offer that option of returning the initial principal to a nominee. For instance, ICICI Prudential offers an annuity plan in which the initial purchase price, or the value of the investment corpus at the end of the accumulation phase with which the annuity was purchased is returned to the annuitant's nominee on the death of the annuitant.

[24] This tends to make life insurers price annuities conservatively. For eg, calculations based on LIC's mortality table show that implied life expectancy at age 60 is about 20 years, but Census extrapolation indicate that it is 19 years (Annexe II) .

[25] Pejawar (2008).

[26] The concept of using electronic platforms to disseminate information about annuity rates has already been adopted successfully in Chile. The *sistema de consultas y ofertas de montos de pensión* or "SCOMP" system allows prospective annuity buyers to send a quote into the system through the pension fund, insurance company or agent. The system transmits the quote to annuity suppliers, and their response is sent back to the purchaser, who can choose an annuity offer, make a new quote, opt out of annuitisation, or ask for an external quote. For more information on SCOMP, please refer to AFP Association Research Series no. 44, August 2004, downloaded on December 16, 2008 from http://www.afp-ag.cl/ingles/estudios/EstudioSCOMP.pdf

[27] For instance, some senior citizens' savings schemes could be designed with phased withdrawals at the payout stage. See Asher and Vasudevan (2008) for more suggestions on reform of small savings.

[28] Some fear that a disproportionate share of liabilities of life insurance companies in Chile are in the form of annuities; this would mean that their asset-liability matching would differ considerably from that of an average life insurance company.

[29] A typical phased withdrawal design suggested by industry veteran Mr.Subedhar is as follows:
(i)Divide the purchase price by the then expectation of life. This is the maximum withdrawal that can be allowed. The minimum would be around 30% of the maximum. The annuitant can withdraw within these limits.
(ii)In year two, divide the balance amount by then expectation of life and repeat the process outlined in 1.
(iii) This continues till the annuitant is 80 / 65, when conventional annuity is purchased with balance amount.

[30] Barr and Diamond (2008). They point out that even with 2% annual inflation, the real value of a nominal benefit after ten years is only 82% of its original value, and only two-thirds after twenty years.

[31] In 2007-08, the maturity profile of Central Government debt securities was skewed towards shorter term debt. Of the total outstanding stock of government securities , 20% had less than 5 years to maturity; 44% had between 5-10 years and only 36% of securities had more than 10 years left to maturity. Source: RBI Annual Report for the year ended June 2008, downloaded on January 16, 2009 from http://rbi.org.in/scripts/AnnualReportPublications.aspx

[32] Source: Comments by IRDA Chairman J.Harinarayan at an Insurance Seminar organized by FICCI on December 04, 2008. Downloaded from the Insurance News Section of the Life Insurance Council of India, http://www.lifeinscouncil.org/news.php on December 15, 2008

[33] The BSE Sensex lost about 55% of its value between January 2009 and January 2008.

[34] The Study was conducted by AARP in the US. Source: "US Retirement Accounts lose $2trillion in 15 months", article in livemint. Com, October 8, 2008. Downloaded on October 15, 2008 from www.**livemint**.com/2008/10/08102035/US-Retirement-accounts-lose-2.html

[35] This is the practice in UK, where purchase of annuities is no longer mandated, though retirees have strong tax incentives to annuitize their pension fund by the age of 75 years.

[36] In the course of research for this paper, it was observed that some private insurance companies in India have well-designed websites that provide very useful information. The scope of knowledge available extends beyond details of schemes on offer. Topics such as need for and benefits of retirement planning and features of different types of annuities are discussed; and online tools for simulation of life insurance premiums and payouts are provided. All insurance companies may wish to consider upgrading their webpages to facilitate consumer knowledge in a similar manner.

[37] In the USA, for instance, company sponsored training on 401(K) plans were found to improve participation as well as savings