Annuity Markets in Comparative Perspective

Do Consumers Get Their Money's Worth?

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Dimitri Vittas

Private annuity markets are not well developed even in the most advanced OECD countries. But they are growing rapidly in some countries, in response to mandatory retirement savings plans. Preliminary results show that in these countries the cost of annuities is lower than might be expected.
Summary findings

Pension reforms normally focus on the accumulation phase, plus term insurance that provides benefits for the disabled and for dependent survivors, all of which are immediate concerns. Decumulation of the capital in workers’ retirement savings accounts appears to be far in the future. But in the second generation of reforms, countries have begun paying attention to eventual decumulation—either through gradual withdrawals or through annuitization, which provides longevity insurance. At this point it becomes important to learn whether annuity markets exist and how they operate.

James and Vittas summarize preliminary results of a continuing research project that analyzes annuity markets in Australia, Canada, Chile, Israel, Singapore, Switzerland, and the United Kingdom. They focus on understanding whether annuity markets can be relied upon to provide reliable retirement income at reasonable prices.

One way to approach this question is to explore whether the expected payouts and the “money’s-worth ratio” differ across countries, and if so, why, and what light can be thrown on the existence and amount of adverse selection.

Annuity markets are poorly developed for various reasons: worker myopia, precautionary and bequest saving (not served by most annuity products), distrust of insurance companies (and unwillingness to turn sizeable savings over to them), adverse selection, and the crowding-out effect of social security (which automatically annuitizes the largest share of people’s retirement wealth).

Preliminary findings suggest that the cost of annuities is lower than might be expected. When the risk-free discount rate is used, the money’s-worth ratios of nominal annuities based on annuitant mortality tables exceed 97 percent (in some cases they are over 100 percent). Even when population mortality tables are used, they exceed 90 percent—neither the industry “take” nor the effects of adverse selection appear to be as large as anticipated.

But real annuities (in Chile, Israel, and the United Kingdom) have money’s-worth ratios 7 to 9 percent lower than those of nominal annuities. And when the “riskier” corporate bond rate is used for discounting purposes, there is a further 7 percent reduction.

The main policy issues include public versus private provision, the role of insurance companies in term and risk intermediation, the level of compulsory annuitization, and the need for robust regulation of annuity providers.
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Introduction

Pension reforms normally focus on the accumulation phase, plus term insurance that provides benefits for the disabled and for dependent survivors, all of which are immediate concerns.\(^1\) Decumulation of the capital in workers’ retirement savings accounts appears to be far off in the future. But in the second generation of reforms, countries have begun to pay attention to eventual decumulation, either through gradual withdrawals or through annuitization which provides longevity insurance. At this point, it becomes important to learn whether annuity markets exist and how they operate.

We have undertaken a project that attempts to analyze annuity markets around the world. We are particularly interested in understanding whether these markets can be relied on to provide reliable retirement income at reasonable prices and what kinds of market failure can be anticipated. One way to approach this question is to explore whether the expected pay-outs and the “money’s worth ratio” differ across countries, if so why and what light we could throw on the existence and size of adverse selection. In this paper we present some preliminary results.\(^2\)

In our project we included studies of annuity markets in Canada, the UK, Switzerland, Australia, Israel, Chile and Singapore—a variety of high and middle income countries.\(^3\) Not surprisingly, annuity markets are poorly developed in these countries, as elsewhere. This phenomenon may be due to a variety of reasons: worker myopia, the precautionary and bequest motives for saving which are not served by most annuity products, a general distrust of insurance companies and unwillingness to turn over to them a large accumulation of savings, adverse selection, and a crowd-out effect by social security, which automatically annuitizes the largest share of peoples’ retirement wealth (James and Vittas 1999, Vittas and Skully 1991). But annuity markets are growing

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\(^1\) For a discussion of how countries have dealt with disability and survivors insurance see James and Vittas 1999.

\(^2\) The numbers we present should not be quoted because they will probably be further refined and modified. However, we expect that the general tendencies will remain. Numbers on Singapore will be added later. Preliminary results indicate that their payouts and money’s worth ratios are very high.

\(^3\) The country studies were done by David Knox-Australia, Hyan Tae Kim and Keith P. Sharp-Canada, Jonathan Callund-Chile, Avia Spivak-Israel, Chiu-Cheng Chan-Singapore, Michael Breuer and Peter Zweifel-Switzerland and Mamta Murthi, J. Michael Orszag and Peter Orszag-U.K.
rapidly in some cases, such as the UK, Australia, Chile and Singapore, that have decided to rely on mandatory retirement savings accounts to provide security in old age.

The underdevelopment of the industry manifests itself in many ways: its small size relative to other kinds of insurance, the absence of mortality tables which are a prerequisite to sound pricing and funding policies, and the relative paucity in most countries of long term financial instruments with which to match assets and liabilities, thereby creating substantial reinvestment risk. One might expect, in view of these signs of an undeveloped industry, that it would not provide good service to consumers and its “money’s worth ratio,” the present value of the expected stream of benefits divided by its initial cost, would be low. We might also expect to find substantial adverse selection, as only small proportions of the population are in the market. However, we find just the opposite.

A money’s worth ratio (MWR) of 1 indicates that the consumer is getting back, in present expected value, exactly what he put in. This would be surprising, in view of the fact that the annuity company is incurring some administrative expenses and is providing investment and longevity insurance, which are not cost-free. Normally, therefore, we would expect the MWR for people who purchase annuities to be less than 100%. We would also expect a substantially lower ratio for the average member of the population, most of whom have decided not to purchase annuities. What did we find?

When using the risk-free discount rate, MWR’s of nominal annuities based on annuitant mortality tables exceed 97% (in some cases they are over 100%) and even when using population mortality tables they exceed 90%—neither the industry “take” nor the effects of adverse selection appear to be as large as anticipated. However, real annuities (in Chile, Israel and the UK) have MWR’s that are 7-9% lower than those of nominal annuities. And when we use a higher “risky” discount rate, we get another 7% reduction.

Where do the companies get the money to cover their expenses, including sales commissions that are reputed to be high, given these seemingly high pay-outs? Why do real annuities appear to be a “worse deal” for consumers than nominal annuities? And which is the correct discount rate? We believe that the answer to all three questions lies in the nature of the insurance company as a institution for term and risk intermediation.
Insurance companies take the premiums that people pay when purchasing an annuity and invest the money at rates that include a long term premium, a risk premium and an equity premium (in corporate bonds, equities, real estate as well as some government bonds)—then turn these long term medium risk investments into a risk-free annuity which is sold at a price that is actuarially fair at government bond rates, for a mixture of short and long term pay-outs. The company covers its costs and earns a profit on the investment spread. Later, we discuss the issue of whether annuities really are risk-free and whether consumers really want a risk-free annuity (as opposed to a riskier annuity that pays a higher return). The question of whether people get their money’s worth depends in large part on how efficiently insurance companies perform this term and risk intermediation function and whether people want them to perform it.

Part I of this paper presents some background information about the growth of the annuity industry under new multi-pillar systems. Part II describes our data, methodology and results with respect to the money’s worth analysis. Part III discusses policy implications, including the cost-effectiveness of public versus private provision of annuities, how to provide inflation insurance, and whether adverse selection makes compulsory annuitization desirable.

I. The Annuity Industry

The annuity industry is minuscule in most countries. But in countries that have instituted mandatory retirement savings plans, it is growing rapidly. Typically these countries constrain the kinds of pay-outs that people can choose upon retirement, making annuities one of a very limited set of choices.

For example, the Australian annuity business is developing only now, as a consequence of its new superannuation scheme, which requires workers to accumulate large retirement savings that they can then use either in gradual withdrawals or in annuity purchases. In Australia in 1994, when this scheme started, assets backing life annuities were only A$1.3 billion or 4% of non-superannuation assets in life insurance companies, whereas by 1998 they were $3 billion, over 10% of non-super life insurance assets.
In Chile there was no annuity business prior to the new AFP system, but that has changed drastically. Currently, when workers retire in Chile they are required either to leave their money in their AFP for programmed withdrawals, to take an immediate annuity, or to purchase a deferred annuity with programmed withdrawals in the meantime. Keeping money in the AFP allows it to earn a risk premium but the annuity option provides investment and longevity insurance. Annuities have other advantages: if a worker has enough savings to purchase an annuity that exceeds 50% of his average wage over the last 10 years, he can “retire” early and stop contributing to the mandatory system, while continuing to work. If the annuity exceeds 70% of his average wage, the rest can be taken out as a lump sum—he can get immediate access to his retirement savings. Insurance companies can buy the workers’ “bono” (a compensation bond for work under the previous system) at a discount, thereby helping him to retire early. As a result of these incentives, the annuity business has grown dramatically in Chile. Its reserves have risen from US$1.5 billion in 1988 to $7.7 billion in 1998 and are expected to reach $37 billion in 2010. Annuities, especially early retirement annuities, are now 2/3 of total life insurance sales.

Likewise, Singapore’s annuity market started in 1987 when annuities became one of the allowable options for the retirement savings that workers were required to accumulate in their retirement savings accounts (the Minimum Sum Scheme). At the age of 55 workers must set aside $55,000 (now $60,000) to buy a deferred annuity, to deposit with a bank or to leave with the Central Provident Fund (CPF). If they buy an annuity they acquire longevity and investment insurance that they would not have otherwise. Additionally, insurance companies have tried to offer consumers a better initial rate than they could get under the other options, which pay low interest rates. As a result of this Scheme, the annuity business is growing rapidly in Singapore and new annuity premiums are now 15% of total new insurance business.

The industry appears to start out concentrated, gradually grow less concentrated as its expands in size, and is international in scope. In 1988 the life insurance industry in Chile (mostly annuities) consisted of 9 companies, of which the top one had 47% of the market and the top three had 87%. By 1998 there were 23 companies, the largest one
having only an 11% market share and the top three 30%. All except four are foreign owned or joint ventures, and seven have close ties with specific AFPs.

II. Do Consumers Get A Good Deal?—the Money’s Worth Ratio

Do these annuity companies provide good value for money? Are private annuities a good way to provide old age security? We proceed now to analyze empirical evidence that bears on this issue. We assembled a team of economists and actuaries from seven countries and asked them to analyze the annuity markets in their countries. We also asked them to calculate the MWR for several annuity products. We followed the same procedure for measuring the MWR that was followed in Friedman and Warshawsky 1990 as modified by Mitchell et al 1997 and Brown et al 1999, three of the seminal papers on this topic. This procedure was described in a manual that was prepared by Brown and shared with all team members.

The original Warshawsky, Brown and Mitchell papers were written about the US and UK. So it is not surprising that when we tried to apply it to other countries where financial markets were less developed, implementation problems soon developed. The main issues concerned the relevant interest rate and mortality tables.

Data and methodology

Mortality tables. Since annuitants collect benefits as long as they will live, we need to know what the probabilities are of life and death for each remaining year to ascertain the expected present value of the benefit stream. Cohort mortality tables are needed for this purpose. Such a table shows, for a given cohort such as all those who are 65 year old today, year-by-year survival probabilities. Because of improvements in health and medical technology, these probabilities will be higher for people who are currently 50 years old, and even higher for their children.

To develop a cohort mortality table, we might start out with a period table that gives current age-specific mortality rates on a cross-sectional basis, but a longevity improvement factor must be built in to turn it into a cohort life table. When projecting the
pricing and funding policies of a company, or when consumers are deciding what is the expected value of an annuity to them, it is important to have such a table.

In addition to the need to project longevity improvements—which is always difficult—account must be taken of the differences between the group of annuitants and the population at large. Often, only population-wide data are available, but we really want to know about the annuitant group, whose mortality rates may be lower than average (see discussion of adverse selection below). However, especially in the early years of an annuity market, such data may simply not be available. That is exactly what we found.

Of all the countries in our sample, the UK has the most developed financial market and annuities-pension industry. The UK has long offered occupational pensions but only recently began offering personal pensions. As might be expected, it has collected considerable data on mortality of occupational pensioners, but until this year did not have data on retirees with personal pensions. A new table indicate that this group, too, may have greater longevity than predicted and therefore our MWR’s may be understated by the occupational data that we used.

The lack of a previous life or annuity business means that no annuitants’ mortality table has been developed in Australia; instead they use a table based on UK annuitants in 1980, with an allowance for mortality improvements. Our calculations (as well as rules of Australian regulators) assume that the current cohort of retirees in Australia will have a mortality rate 60% that of the 1980 table. This seems to fit recent Australian experience with males but may understate the longevity and therefore the MWR of females.

In Singapore too, companies have little data on which to base their pricing. They also use UK data, this time from 1967-70, with mortality improvements projected to 1990 and with a two year setback to account for future mortality improvements (a very crude adjustment factor). The scanty evidence available thus far suggests that actual deaths are far less than expected.

In Israel we used data collected by a single large pension fund, supplemented by new actuarial tables that are about to come into use. Insurance companies have been using UK life tables—these are obviously serving as a public good around the world. Israel has no carefully developed cohort life tables of its own. In Switzerland the first population cohort tables were published in 1998 and no annuitants’ tables are publicly
available. Our team was granted confidential use of the tables of the Swiss Life Insurance Association for the MW calculations. Only now is Chile developing and up-dating its annuitant and population mortality tables.

Even in the presence of public accurate mortality information, it is difficult to know how to value annuities because future life expectancy remains an unknown. When public accurate information is unavailable, the task becomes much more difficult. It is probable that lacking this information, people consistently underestimate their life expectancy, basing their guesses upon the death rates of people around them now, rather than what is likely to happen in the future. That could be one reason for the low voluntary purchase of annuities, in unconstrained situations. It is also possible that the tables we have used underestimate future increases in life expectancy and therefore the MWR received by the average annuitant. If so, this will also mean that future costs and obligations of insurance companies will be higher than they expect.

**Interest rates.** Ideally, the term structure of interest rates should be used to discount future annuity payments, and these were available for long durations in the US and UK. The reason for using the term structure is that the relevant interest rate is often different in the short run and the long run, and annuity payments are received in both periods, hence different discount rates should be used.

If the annuity is viewed as guaranteed and risk-free, the government bond rate is usually appropriate. Alternatively, if some risk is perceived to be involved, the discount rate should be higher. Earlier papers on this topic used the AA corporate bond term structure as the alternative “risky” rate.

However, in most of the countries in our study government bonds of long duration were not available and the corporate bond market is thin. For example, in Australia, which has one of the better developed financial markets, the longest government bond duration is 12 years. In Singapore 10 years is the limit on government bonds; in Chile 18 years. In Israel government bonds have a maximum duration of 15 years and the yield curve has virtually no slope (in contrast to Switzerland and Singapore which have steep

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Blake (1999) notes that mortality forecast errors of up to 20 percent over intervals as short as ten years are not uncommon.
slopes). In cases where duration was limited, we extrapolated forward the last government bond rate into the future.

The corporate bond market is even more limited and with even less duration. In Australia, Israel, and Singapore, where the corporate market is too thin to yield a term structure, 1% was added to the government bond rate to get a "risky" rate. In Switzerland, where corporate bonds have only a 10 years' duration, .9% was added to the government bond rate after 2008. In the UK where the corporate market is well developed, the government-corporate rate differential of .69% was derived from the first 10 years of experience and extrapolated forward; in Canada a similar procedure led to a differential of .8%. In Chile mortgage bonds were used as the substitute for corporate bonds, and a constant differential of 1.09% was maintained after 15 years.

How are we to interpret this procedure? Non-existent rates cannot be interpreted as the rate of return consumers can get on comparable investments. Indeed, consumers, like insurance companies, cannot make long term investments in economies where these do not exist. Under these circumstances, the purchase of an annuity may have greater value to consumers than these MW ratios indicate, because it fills in a market gap in allowing them to make a long term investment. (The existence of a demand for this long term financial instrument may also create a supply of other long term instruments. For example, in Chile, AFP's and insurance companies whose main product is annuities, are the major holders of medium term home mortgage bonds).

We interpret these rates simply as hypothetical indications of peoples' time preferences and government policies in these countries. We note that, despite global capital markets, interest rates do vary across countries, and these variations may indicate time preferences and policies which would continue to obtain over longer durations. One question we investigate is whether these variations in interest rates have systematic effects on annuity payouts and MWR's. The term structure data we used are presented in Table 1.

Results

Payouts. Table 2 presents average monthly pay-outs available for a variety of annuity products in our sample of countries. Pay-outs begin at age 65; for ages 55 and 75
see the Appendix. Focus first on row 1, Panel A, which deals with nominal annuities for men. We see there that a single premium individual annuity (SPIA) that an individual buys for $100,000 at the age of 65 will yield varying amounts ranging from $590 in Switzerland to $754 in Canada, with Australia and the UK in the middle. How can we explain this difference?

Part of the explanation may lie in the international differences in interest rates. Insurance companies invest the premium that they receive, and if they expect to get a higher return on their investments they are willing to offer a better benefit to consumers. Indeed, we find a close correspondence between the ranking of countries by interest rates and their ranking by pay-outs on the nominal SPIA. (The only exception is Singapore, which may be overpricing its annuities, as discussed below).

Moving toward other annuity products in Panel A, the data from Australia, Canada and the UK allow us to measure the trade-offs between different types of insurance that a worker might want to buy. In Australia, a consumer can get $700 per month for a SPIA, but if he wants a 10 year guaranteed payment (which would be paid to his beneficiaries in case of his death) to provide a bequest to his family in case he dies relatively young, he must forego 6% of that monthly benefit, and will get only $658. If he wants a joint annuity that will cover both him and his wife (who is assumed to be 5 years younger in this example) he must forego another $105 which is an additional 15% of the original price. In Canada and the UK the numbers are not identical but they are similar. In most countries, the majority of annuitants choose to purchase guaranteed payments or joint annuities in order to provide a survivors’ benefit, but they pay an opportunity cost in terms of a lower initial benefit. In Chile a joint annuity is required. This should be taken into account in projecting the retirement savings that will be needed to finance an acceptable income level in old age. Because survivors’ insurance and bequests through guaranteed payment periods and joint annuities are ordinarily part of the package, the amount of savings and contributions required to provide a given replacement rate is greater than it would otherwise be.

Panel B shows that if gender-specific mortality tables are used women get lower pay-outs than men because of their greater expected longevity, but the above relationships hold for them as well.
Finally, looking at Panel C which presents real annuity pay-outs for the four countries where they are available, we observe that the rankings by pay-outs again correspond to rankings by interest rates. (The interest rates given for Chile and Israel are real while those for Australia and the UK are nominal; the corresponding real rates would be about 2 percentage points lower). For the UK and Australia, which offer level nominal, indexed and escalating annuities (escalating annuities rise at a fixed rate each year), the initial pay-out for the level nominal is much higher than for the others although their relative positions might be reversed 10 years later. Peoples’ choices here depend in part on their time preferences, suggesting that it is important to offer a range of products that will satisfy differing tastes to encourage annuitization.

Table 3 presents evidence of price dispersion in Australia, Canada and the UK. We see there that pay-outs are tightly clustered, especially in Canada where price dispersion is less than 5% from top to bottom. The ready availability of on-line information in Canada may lead to clustering for any company that wants to stay in the market. Unfortunately we do not know the quantities that go along with these prices, nor do we understand the forces that lead one company to offer better rates than others—factors such as a desire to increase sales at a particular time, or to offset life insurance risk, or to take advantage of good investment opportunities may be involved. In Switzerland prices are uniform, set by the Life Insurance Association, and in Israel they are also reputed to be uniform given a tradition of cartel-like behavior in the insurance industry, but that may change in the future due to pressures for greater competition.

The high money’s worth ratio of nominal annuities. Table 4 presents the money’s worth ratio for annuities that begin at age 65 for our sample countries, using the government bond risk-free rate. (MWRs beginning at ages 55 and 75 are shown in the Appendix). We observe, first, that among nominal annuities, and using the annuitant mortality tables, the MWRs exceed 96% for every annuity type and country and 100% for Canada, Singapore and Switzerland. The MWR is highest in countries with a steep term structure, which allows insurance companies to earn higher long term rates (some of which makes its way into pay-outs) while the MWR is discounted at the lower short term rate for many years; this probably accounts for the exceptional MWRs in Switzerland and Singapore. Another reason may be that Swiss annuities include a “bonus”—about 10% of
the total pay-out—which has been given regularly but is not guaranteed, hence investment and cohort mortality risk are effectively shared with annuitants in Switzerland (In Singapore the guaranteed annuity that we are working with must compete with variable “participating” annuities that are offered and popular).

Although pay-outs were much lower for women, the MWR is the same for both genders, once life expectancy is taken into account. With the exception of Australia, these numbers are higher than those found in earlier studies for the UK and UK (Mitchell et al 1997, Brown et al 1999, Poterba and Warshawsky 1999, Finkelstein and Poterba 1999). If people want a risk-free annuity and if these annuities are indeed risk-free, they have gotten a good deal, paying virtually nothing for longevity and investment insurance.

**The average worker and adverse selection.** However, if we use the mortality tables for the entire population, the MWRs drop by 6-9%. For example, an Australian worker with an expected lifetime that is average for the population as a whole, who wants to buy a SPIA, will only get a MWR of 91.4%. She is paying about 1.5% for general expenses and 7% in “adverse selection costs. Earlier studies have also found evidence of adverse selection, although usually somewhat larger.

One of the reasons for adverse selection is well known—asymmetric information. Consumers know more about their health status and life expectancy than insurance companies, but “good” risks (who will die young) are unable to signal this to insurance companies to secure a better rate, so they withdraw from the market, leaving the companies only with the “bad” risks, with greater than average longevity—which is exactly what we find. Annuitants have greater longevity than the population as a whole. Therefore, when we measure the MWR using the average population-wide life tables, we get a lower MWR. The inability of the “average” worker to get insurance on actuarially fair terms (which may discourage him from purchasing it) is a classical market failure and has sometimes been used as an argument for mandatory annuitization.

Of course, asymmetric information is not the only reason for the appearance of adverse selection. Another reason may be that voluntary annuities are a “luxury” good with a high income elasticity of demand so wealthy people, who have greater longevity, are disproportionately buyers. Insurance companies could charge these people a higher
risk premium, since their higher income and wealth is readily observable. But they don’t—or do they?

Each annuity contract has a fixed cost attached and this will be a smaller percentage of a large policy. Rich people tend to buy larger policies. Implicitly, annuity companies may be charging a higher risk premium with a smaller expense ratio to wealthier people who buy larger policies and a lower risk premium with a higher expense ratio to poor people who buy smaller policies. In this case, the higher fee charged to low earners may dissuade them from purchasing annuities but it is not an example of market failure since it reflects real costs. Additionally, even if low earners were not charged a higher fee (given a lower MWR), many of them might have chosen not to buy an annuity given the constraints on their income. The adverse selection stemming from the correlation of income with longevity and annuity purchases is not an example of market failure although it clearly has policy implications (for a further discussion of selection issues see Finkelstein and Poterba 1999).

In some countries “adverse selection” is due to government regulations. For example, in Chile, the annuity option is only open to workers who can afford to buy an annuity that is at least 110% of the minimum pension guarantee. Low and transient earners—who tend to have lower longevity—are left out by definition. Moreover, the annuity market is effectively part of the AFP system, which primarily serves the upper half of the income distribution and urban residents, who have longer life expectancies.

Thus, at least three possible reasons account for the fact that the MWR is lower for the average member of the population than for the group that purchases annuities. And we don’t know what proportion is due to asymmetric information. But perhaps the most striking observation is that, in all of our sample countries, even the average population member loses less than 10 cents on the dollar if he or she decides to purchase a nominal annuity, and only 6-7 cents are lost due to adverse selection, broadly defined.

**Self-selection as an antidote to adverse selection.** One reason why asymmetric information may not play a larger role is that insurance companies and their customers have an incentive to find self-selection techniques that will lead good risks into their own segregated groups. A person who expects to live a long time might purchase a level SPIA, but a person who expects to die young is more likely to purchase an annuity with a