A new old approach
The open group funding method shows why social security systems face solvency problems

by Robert M. Katz

Social security systems around the world have suffered from inadequate funding, leading to current or potential deficits and ultimate insolvency. The most commonly proposed solutions are to raise taxes and/or reduce benefits. Though I was certainly familiar with this issue, it took a strategic asset allocation exercise for the World Bank's staff retirement plan (SRP) to demonstrate that this issue is simply an open group valuation problem.

I know there is a wide divergence of views on the extent of the social security funding problem and the range of solutions. What I discovered, however, is that the solution of raising taxes and/or reducing benefits is a direct actuarial consequence of the inadequate funding that created the problem in the first place.

Mini-social security system
As the World Bank's staff actuary for the SRP, I have been involved with funding and asset/liability issues for a plan that might be considered a mini-social security system. The bank's staff members come from many countries and usually are not covered by their home-country social security systems (with the major exception of U.S. nationals), so the SRP is designed as a primary plan, combining elements of both private pensions and social insurance. The SRP is qualified in the United States as a governmental plan, so it is not subject to funding standards, enabling the use of the open group funding method.

The open group funding method is based on the assumption that a plan is ongoing so that future new entrants are included in the valuations. The liabilities under this method consist of the present values not only of benefits in payment and benefits expected to become payable for current participants, but also of benefits expected to become payable for new entrants. Correspondingly, the assets include the present values of expected future contributions made by or on account of current participants and also new entrants.

Required: assumptions of number of new entrants
In using the open group method, it is necessary to make an assumption regarding the number of future new entrants. The SRP assumption is that each terminating participant is replaced, so that the active participant population remains constant while the retired population grows. The assumption for most social security systems has been that the active participant population would be growing.

When evaluating the funded status of any ongoing plan, the most appropriate measure is the open group funded ratio. This ratio compares the current market value of assets to the total open group liabilities. The difference between the open group liabilities and current assets is simply the present value of future contributions. Accordingly, the value of this ratio would usually be between zero and one. A negative value would result if past benefit payments had exceeded past

funding. A zero value would result from a pay-as-you-go (PAYGO) approach. A value of one or more would result if current assets were sufficient to pay the benefits of all current and future participants.

In examining further the funded status of a plan, it is instructive to consider the progression of values for the open group funded ratio over time. In general, that series is a function of the relative growth of the active and retired populations. Under the SRP assumption of a constant active population and growing retiree population, the same number of contributors is supporting a growing number of benefits recipients. Under the typical social security system assumption, a growing number of workers would be supporting a growing number of retirees. The progression of open group funded ratios over time is directly affected by these assumptions.
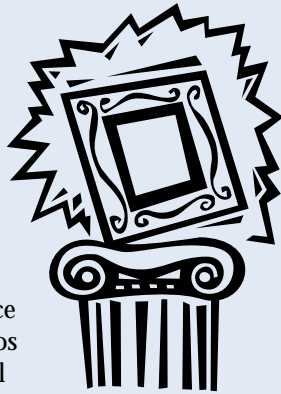
In the strategic asset allocation exercise, both assets and liabilities were projected over time, and the series of contribution rates and open group funded ratios were determined. Two contrasting relationships were observed. To meet the funding objective of a non-decreasing funded ratio, the contribution rate had to increase over time. Conversely, to meet the budgetary objective of a non-increasing contribution rate, the funded ratio had to increase over time.

Many conclusions
These observations were a consequence of the open group funding method,

Photos, recollections needed for SOA's 50th anniversary

The Society of Actuaries marks its 50th anniversary in 1999, and special events and publications for this celebration are now being planned. One of the projects will be the creation of a 50th anniversary book, in which special SOA events and advances in the profession since 1949 will be outlined in photos and narrative. *The Actuary* will also focus on historical events in its 1999 issues.

You can become part of this important effort by contributing copies of photos you have taken through the years with the events and people pictured identified. Please send only photos that you do not need returned; the SOA cannot be held responsible for one-of-a-kind photos. Please make a duplicate print for yourself before sending it in.

We also are asking that you write us about people and events you recall as having been significant to the SOA's history. In some cases, you may just want to send in some ideas or a short outline for the SOA Communications staff to expand on after more research and personal interviews.

Please send your photos and letters to Cecilia Green, Director of Public Relations, Society of Actuaries, 475 N. Martingale Road, Suite 800, Schaumburg, IL 60173. Questions also may be directed to her (phone: 847/706-3561 fax: 847/706-3599; e-mail: cgreen@soa.org).

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which led to several other conclusions. The assets must grow relatively faster than the liabilities in order to maintain a constant contribution rate with a constant active population. In other words, the open group funded ratio must increase over time. If the assets are not growing sufficiently, then just to maintain the same open group funded ratio over time, the contribution rate must be increased. If the contribution rate cannot be increased, then the liabilities must decrease relative to assets. Finally, if the contribution rate cannot be increased, and the liabilities do not decrease, then to maintain the same funded status, the active population must grow in order to provide a greater contribution base.

At this point the light bulbs went on. I had discovered an analogy to the social security funding problem. Social security systems assume that a growing number of workers will support a growing number of retirees, so PAYGO or minimal funding would be adequate. Tax rates and benefits would remain constant. Unfortunately, in most countries with well-developed economies, the worker populations are not growing, tax rates are not increasing, and benefits are not being reduced sufficiently. Under the open group analysis, the inevitable consequence is insolvency.

If a social security system is not funded adequately, the only means to maintain solvency is through a growing aggregate payroll. Growth must occur through workforce growth, real wage growth, or a combination. If the payroll does not grow sufficiently, then the funded ratio must increase over time. This occurs only if tax rates are raised to produce advance funding or if benefits are reduced. In other words, only two options exist: increase the assets or decrease the liabilities. That is precisely the conclusion that now seems so clear, and it derives directly from actuarial analysis. If the contributing population is not growing fast enough to support the system, then raising taxes and/or reducing benefits is the only answer.

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