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A Variable Benefit Plan for the Public Sector

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Three important risk areas in pension funding are investment return, inflation and mortality.

In a pure defined benefit plan, the plan sponsor bears all of the risk and reaps all of the rewards related to these and all other risk areas. Bad experience drives the Actuarially Determined Employer Contribution (ADEC) upward while good experience pushes it downward. If the experience happens within relatively narrow bounds, the ADEC will tend to move within a relatively narrow range and, assuming the plan sponsor has no particular financial problems, all will be well. That hasn't happened lately though. In fact, experience has been volatile for a long time and some plan sponsors do have financial problems.

In the 1980s and 1990s investment gains were so overwhelming that by 2000 many plans had become fully funded years ahead of schedule. In many cases, contribution rates plummeted, or permanent benefit increases were negotiated, or both. Then came the Millennium and along with it, the burst of the tech bubble and the credit crisis. Both of those events hammered the holdings of almost every pension fund and made previous contribution reductions and benefit increases appear to have been ill advised. ADECs increased rapidly to levels close to or above those that had been in effect 20 years prior. The increases in ADECs occurred just as plan sponsor revenues were declining due to the ensuing recessions. One municipal plan sponsor representative, who was likely not alone in his impressions, spoke of a “dizzying rate of contribution increase to unsustainable levels” and ultimately closed the city’s pension plan. (In fact, in that instance, contribution rates had increased from a nominal amount to a level just above the normal cost.) In other cases, future benefit accruals were reduced, retiree Cost-of-Living Allowances (COLAs) were cut, and new lower tiers of benefits were introduced for new hires. (See, for example, National Association of State Retirement Administrators [NASRA]: “Spotlight on Significant Reforms to State Retirement Systems,” December 2018.) There were also some well-known municipal bankruptcies that were blamed partly on municipal pension plans. Many of these problems were caused to a large

extent by asset volatility and the manner in which a traditional DB plan design responds to it.

Amid all of this, the shining light, the beacon on the hill, the lamp that gives light to the house, is the State of Wisconsin’s variable benefit plan. Well, that may be a flowery exaggeration, but it is not an exaggeration to say that the Wisconsin Retirement System’s (WRS) variable benefit features have allowed it more stability than most of its sister plans have experienced. The WRS has deviated relatively little from being fully funded throughout the 1990s and 2000s. ADECs that were 11 percent at the end of the 1980s, dropped to 9 percent in the early 2000s and are currently just more than 13 percent of pay. Some of the decreases and some of the increases were brought about by legislated changes, rather than by the response of the plan design to external forces. Without those changes, ADECs would have been yet more stable than they actually have been.

Pressure seen elsewhere for wholesale plan changes failed to gain traction in Wisconsin. According to a May 9, 2018, *BloombergOpinion* article titled “Wisconsin’s Pension System Works for Everyone”:

There’s been some pressure on states in recent years to shift from pensions to DC plans. In 2011, newly elected governor Scott Walker and the Republican majority in the Wisconsin Legislature passed a law ordering state officials to look into moving [in] that direction. In 2012, the heads of the three state agencies charged with this task—two of them Walker appointees—turned in a report that effectively answered, *Why on earth would we ever want to do that?* And really, why would they?

AN EXAMPLE PLAN

Systems other than Wisconsin have also implemented different versions of variable benefit plans, with varying degrees of success, and all of those models are certainly worthy of study. This article, however, limits itself to treating an idealized variable benefit plan that contains the main features of the Wisconsin Plan. The author has added some features to the design and modified others in order to better reflect current conditions and to incorporate some lessons from prior experiences. (See Table 1)

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Table 1
Example Plan

Normal Retirement Age	67 with 5 years of service.
Early Retirement Age	55 with 20 years of service; actuarially reduced.
Final Average Compensation	Average of highest 5 out of last 10.
Employee Contribution Rate	4% of pay.
Benefit Computation	<p>At retirement, a participant's benefit is the greater of the Guaranteed Minimum Benefit "GMB" and the Money Purchase Minimum "MPM" as described below:</p> <p>The GMB is 1.3% times final average compensation times service (actuarially reduced if appropriate).</p> <p>The MPM is the annuitized value of twice member contributions with interest credits as described below; annuitization calculated at 4%.</p>

Vesting:	5 Years.
Vested termination benefit	Normal or early retirement benefit depending on when the member takes the benefit. Member may also take a refund of contributions with interest in lieu of a vested retirement benefit.
Nonvested termination benefit	Refund of contributions without interest.
Death-in-service and Disability benefits	Not important for this discussion.
Optional Benefit Forms	Based upon 4% interest and (unisex) valuation mortality.
Actuarial assumptions	
Investment Return Preretirement	6%.
Investment Return Postretirement	4%.
Mortality Table	Current, fully generational.
Accounting	Nonretired and retired assets separately maintained. At time of retirement, a reserve transfer from the nonretired to the retired reserve is made based upon 4% interest and valuation mortality assumptions.
Actuarial Value of Assets	Typical 5-year smoothing based on 6% return assumption.
Interest Crediting	Interest is credited (or debited) to all reserves including employee accounts based upon the rate of earnings on the actuarial value of assets.
Asset Allocation	All assets are comingled for investment purposes. Target allocation is designed to produce a long-term median return of 6%.
Post Retirement Adjustments (PRA)	This plan does not provide a COLA as such. Instead, retiree benefits may be increased or decreased within limits based upon the results of the actuarial valuation. Retiree benefits can never fall below the Guaranteed Minimum Benefit and will not be increased beyond a level that can be justified by inflation.

This plan design divides risk among present retirees, future retirees, and the plan sponsor.

RETIREE RISK SHARING

Since in most plans today, half or more of the liabilities are due to retirees, let's first discuss retiree risk sharing. Retiree risk sharing occurs primarily through the operation of the Post Retirement Adjustment (PRA) feature. Retired assets are tracked separately from nonretired assets although they are invested in the same manner. When a person retires, either directly from active service or from deferred vested status, an amount of money is transferred from the active reserves to the retiree reserves sufficient to fund a nonincreasing benefit assuming 4 percent return and valuation mortality. At the end of each year the actuary performs a valuation of retired lives (assuming 4 percent future investment return) and reports the ratio of (actuarial value of) assets to liabilities in the retiree reserve. If the ratio is greater than 100 percent, a Post Retirement Adjustment (PRA) is granted, and everyone gets the same percentage adjustment. If it is less than 100 percent there is a negative PRA, which means that retiree benefits are reduced in order to restore the ratio to 100 percent.

There are a few exceptions though.

- Regardless of experience, no retiree's benefit can be reduced below the GMB amount due to a negative Post Retirement Adjustment. This can lead to an unusual situation. If there is a succession of bad experience, and therefore a succession of negative PRAs, the benefits of some people may have already been reduced to the GMB level. If that occurs, since the benefits of such people cannot be further reduced, then the benefits of everyone else will be reduced by a larger percentage than the ratio of assets to liabilities would otherwise suggest.
- Post Retirement Adjustments are limited to the rate of inflation. Inflation is measured over the one-year period ended on the valuation date. Regardless of the ratio of assets to liabilities, everyone's PRA is limited to the same inflation percentage (that is, there is no individual PRA bank). There is, however, an aggregate PRA bank. Asset amounts, if any, that are not needed to fund the inflation-limited PRA are transferred to a separate Post Retirement Adjustment stabilization reserve. All or a part of the stabilization reserve can be released to prevent or ameliorate negative Post Retirement Adjustments and, therefore, also the unusual situation just described.
- The PRA (whether positive or negative) for people who retired in the year ended on the valuation date is prorated based on month of retirement.

Retirees also share in the mortality risk. If there is a mortality gain or loss, or if there is an experience study and the mortality table is updated in either direction, there will be an effect on the liability measure for existing retirees, but there will be no effect on the retiree assets. There will, therefore, be an effect on the ratio of assets to liabilities, and, hence, on the PRA.

This plan protects retirees from inflation to a certain extent, but once there is a year in which inflation exceeds the PRA that can be provided, that piece of inflation falls on the retiree. The PRA bank is intended to mitigate the effect of inflation on retirees, but it probably cannot eliminate it.

FUTURE RETIREE RISK SHARING

Future retirees share in investment risk—and in potential rewards. A period of relatively high interest credits prior to retirement can increase the projected Money Purchase Minimum Benefit (MPM) benefits over the Guaranteed Minimum Benefit (GMB). If preretirement investment experience is subsequently unfavorable, the increase in projected benefits for future retirees is effectively rolled back due to a reduction in interest credits to member accounts. This is loosely similar to the operation of the retiree PRA.

At actual retirement, the interplay between the GMB and the MPM determines the initial retirement benefit. The GMB is 1.3 percent times final average compensation times service. Regardless of plan experience, future retirees will get at least the GMB at retirement. However, the MPM may produce a greater value. For the MPM calculation, twice the member account, with interest credits at the rate of return on the actuarial value of assets, is annuitized at retirement. The result is compared with the GMB and the greater amount becomes the initial retirement benefit. *The MPM does not become a guaranteed benefit at retirement, though. Only the 1.3 percent GMB is guaranteed.*

Future retirees also share to a certain extent in mortality risk because changes in the mortality table affect the factors used to calculate the MPM.

Table 2 shows how the MPM would affect an individual under various return scenarios. The example person was hired at age 35 with an initial pay of \$30,000 and always received 2.75 percent pay increases. Investment return was always 6 percent

This plan design divides risk among present retirees, future retirees, and the plan sponsor.

Table 2
Money Purchase Minimum Benefit Under Various Return Scenarios

Age	Retirement		Final Average Salary (FAS)	GMB Minimum Benefit	MPM Minimum Benefit Depending on Account Credit for 10 years prior to Age 55		
	Service	Early Factor			6%	10%	2%
55	20	0.354	\$47,614	\$4,382	\$6,772	\$9,162	\$5,013
56	21	0.383	\$48,923	\$5,115	\$7,556	\$10,131	\$5,660
57	22	0.416	\$50,268	\$5,981	\$8,418	\$11,194	\$6,374
58	23	0.451	\$51,651	\$6,965	\$9,366	\$12,363	\$7,161
59	24	0.490	\$53,071	\$8,114	\$10,412	\$13,648	\$8,030
60	25	0.533	\$54,531	\$9,446	\$11,563	\$15,061	\$8,989
61	26	0.580	\$56,030	\$10,984	\$12,834	\$16,617	\$10,050
62	27	0.633	\$57,571	\$12,791	\$14,236	\$18,331	\$11,221
63	28	0.691	\$59,154	\$14,879	\$15,783	\$20,221	\$12,517
64	29	0.756	\$60,781	\$17,323	\$17,493	\$22,306	\$13,952
65	30	0.829	\$62,453	\$20,192	\$19,385	\$24,608	\$15,540
66	31	0.909	\$64,170	\$23,507	\$21,479	\$27,154	\$17,302
67	32	1.000	\$65,935	\$27,429	\$23,801	\$29,973	\$19,258
68	33	1.000	\$67,748	\$29,064	\$26,379	\$33,099	\$21,433
69	34	1.000	\$69,611	\$30,768	\$29,245	\$36,571	\$23,854
70	35	1.000	\$71,525	\$32,544	\$32,437	\$40,432	\$26,553

except for the 10 years immediately preceding retirement. For those 10 years, Table 2 shows alternates of 6 percent, 10 percent and 2 percent. All dollar amounts are annual.

At least in this case, the expected condition (the 6 percent column) is that the money purchase minimum value would provide a greater initial benefit than the 1.3 percent GMB-defined benefit for retirement ages through age 64. For common later retirement ages, the GMB would be greater than the MPM benefit. If, however, there were an extended period of good experience (the 10 percent column), the money purchase MPM benefits would increase and would dominate the GMB at all illustrated ages. Similarly, if there is bad experience (the 2 percent column), the value of the MPM benefit drops, causing the GMB to be the dominant benefit at all but the youngest retirement ages. The 2.75 percent pay increase assumption was somewhat arbitrary. It was chosen to be close to what has been observed in some large plans over the past 30 years. The use of a lesser pay increase assumption would make the MPM appear more valuable than the GMB more often than the chart indicates, and conversely.

EFFECT ON DEFERRED VESTED BENEFITS

Accounts for deferred vested people are subject to interest crediting in the same manner as accounts for active plan participants and at retirement, benefits are determined in the same manner as for members who retire directly from active service. The effect of the MPM can provide a kind of partial indexing to

these benefits. The GMB is frozen, while the MPM moves up with interest crediting. Essentially, such people share in investment risk, but for them, it is often mostly reward.

PLAN SPONSOR RISK SHARING

The Plan Sponsor's maturity risk, or in other words, the risk of plan liabilities dwarfing plan sponsor resources due to increasing numbers of retirees, is greatly reduced by this plan design. The Plan Sponsor continues to share in investment and mortality risk, but to a much lesser extent than in a traditional defined benefit plan. The Plan Sponsor's share of investment risk with this type of plan design relates primarily to nonretired assets, so it is *prima facie* smaller than in most plans. For many plans today, liabilities are six times payroll, and half of those liabilities are for retirees. Typical portfolio standard deviations today run around 13 percent of pay, so if the Plan Sponsor shared in all the investment risk in a fully funded plan, a one standard deviation investment loss (which, in theory, is expected to occur about once every six years) would correspond to 78 percent (6 x 13 percent) of payroll. Even though the effect on the contribution rate would be smoothed by the use of the actuarial value of assets, a lot of volatility would remain. But if that same Plan Sponsor shares only in the nonretired investment risk, perhaps by employing a variable benefit design of the general type discussed in this article, a one standard deviation asset loss might correspond to 39 percent of payroll instead of 78 percent (50 percent x 6 x 13 percent). So this type of variable benefit design

can significantly reduce contribution rate volatility. That is good for the Plan Sponsor and ultimately good for the plan itself. Investment gains will still lower the ADEC and losses will still raise it, but the MPM will act to dampen changes in the ADEC. How does that work? Well, investment gains lower ADECs because assets go up more than assumed when there is a gain. But once there are sufficient gains for the MPM to exceed the GMB, investment gains increase the MPM, and therefore the benefit that the actuarial valuation expects to be paid. Higher MPM benefits increase liabilities, ameliorating the decrease in employer contributions that would otherwise occur. On the flip side, investment losses tend to raise ADECs, but the increase may be dampened by a reduction in projected MPM benefits. Total volatility may not actually be reduced, though. Contribution volatility is exchanged for benefit volatility.

PLAN DESIGN CONSIDERATIONS

The balance between the GMB in the example and the MPM is central to this design. A high GMB compared to the MPM would transfer most preretirement risk to the plan sponsor. The benefit multiplier and employee contribution rates in the Example Plan (1.3 percent and 4 percent, respectively), as well as the factor of 2 in the definition of the MPM, make the design appear to work but are not the only possible choices. The preretirement and postretirement interest rate assumptions (6 percent and 4 percent in the example) are also important parts of the design. The difference between them affects the Post Retirement Adjustments that can be expected. The expectation should be realistic and related in some way to long-term expected inflation. Changes, if any, in these assumptions should be very rare. Obviously in designing an actual plan, demographics and stakeholder objectives would influence the specific plan design that is selected. Plan design would most likely also be influenced by structure and funded status of the legacy plan and issues related to the transition from the legacy plan to the replacement variable benefit plan.

WISCONSIN'S "VARIABLE PROGRAM"

There is one feature of the Wisconsin plan that was intentionally excluded from the Example Plan, because, by virtue of its name, people tend to think it is a main feature of the variable benefit plan when, in fact, it is only a minor piece. The Wisconsin

"Variable Program" offers participants the opportunity to invest half of their contributions (and a matching amount of employer contributions) in a separate "variable" fund that is invested 100 percent in common stock and is valued at market value (no smoothing). Participants who choose the variable program bear all of the risk and reap all of the reward of the common stock investment. The administration is a little complicated, but the variable program has no effect on the plan sponsor's risk. The MPM, for example, is calculated as though the variable program had not been chosen. If the common stock investment does better than the default investment portfolio, the person's benefit at retirement will be higher than the plan would otherwise provide. If the common stock investment does worse, the participant's benefit is reduced accordingly.

CONCLUSION

Variable benefit plans of this general type can provide a good blend of preretirement income replacement, inflation protection, market participation, and contribution rate stability. They do pose some administration and communication difficulties and are subject to political risks. For example, if the PRA stabilization fund were to become large, political pressure for a special retiree PRA might be difficult to resist. Also, a prolonged period of good investment experience could make the MPM dominant, and political pressure for an increase in the GMB (which would appear cheap or free with most valuation methods) would be difficult to resist. What should the poor actuary do? Relax, take a deep breath, exhale slowly, and think "ASOP 51."

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