

Guaranteed Defined Contribution Plans

DEFINED CONTRIBUTION PLANS HAVE EMERGED AS A MAJOR PART OF THE RETIREMENT INCOME SYSTEM. Projections of coverage trends suggest that more workers now participate in 401(k) plans, the most popular type of defined contribution plan, than in defined benefit plans. The projected growth in their assets is impressive—average 401(k) balances at retirement for heads of households retiring in 2035 may be three quarters to two-and-a-half times the expected present value of Social Security benefits.

When defined contribution plans supplemented defined benefit plans, there was relatively little concern about the financial market risk that workers were bearing. Indeed, these plans were the appropriate place to bear risk since workers bore little or no financial market risk through defined benefit plans and Social Security. Some analysts argue, however, that as primary plans, they place too much financial market risk on workers.

There is a way, however, for employers to mitigate this risk by guaranteeing a minimum rate of return as an option for defined contribution plans. Such a plan feature would make defined contribution plans less risky to workers for a given portfolio mix than traditional defined contribution plans because the employer would bear part of the risk.

Guarantees in Defined Contribution Plans

Some guarantees have been provided in defined contribution plans. They vary depending on whether the plan is mandatory or voluntary and, more generally, depending on the laws regulating the plan.

Mandatory defined contribution plans. In Chile, the first of the Latin American mandatory defined contribution plans, the guarantee is stated in terms of a band around the average rate of return for all pension funds. If a plan receives a rate higher than the maximum of the band rates of return, the excess is deposited into a profitability fund. If it receives less than the minimum, it must make up the difference.

This guarantee is backed by three sources of funds. The first source is the profitability fund. If the profitability fund is insufficient, a backup fund is financed by the owners of the pension fund management company. That fund equals 1 percent of the pension fund assets. If this amount is also insufficient, the govern-



ment takes over the pension fund and makes up the difference out of general revenue. Chile also guarantees a minimum benefit for low-income workers who have contributed for 20 years, paid out of general tax revenues.

In Switzerland, where the pension mandate on employers permits but does not require that they provide a defined contribution plan, the guaranteed rate of return is 4 percent. The guarantee is backed first by the sponsoring employer, who is expected to make up the difference. If the employer fails to do so, it's then backed by a mandatory insurance fund. The fund is financed by a tax on wages of covered workers of 0.04 percent of earnings that fall within a prescribed minimum and maximum range.

ERISA plans. An alternative way to provide guarantees is through investment options. The U.S. pension system offers employers and workers some investment options that provide guarantees. TIAA, for example, allows participants to invest in indexed bonds. These bonds provide a guaranteed real rate of return, and thus provide the most complete guarantee possible. Traditional, unindexed U.S. government bonds also guarantee a nominal rate of return that is in effect backed by the federal government.

Another option is to purchase insurance company products. Guaranteed investment contracts (GICs) offer a guaranteed rate of return over a set time. Some defined contribution plans allow workers to purchase insurance company fixed annuities that pay a guaranteed rate of return. Another form of guarantee is an indexed annuity, where benefits are maintained constant in real value.

Non-ERISA plans. Because non-ERISA plans are subject to less regulation, they've been able to pro-

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TABLE 1 The additional employer contribution rate required to raise the plan rate of return to 6 percent

Year	Rate of return <i>r</i> and earnings growth <i>g</i> assumptions (<i>r,g</i>)			
	0%, 0%	4%, 0%	4%, 3%	actual*, 3%
1	0.12	0.04	0.04	0
2	0.25	0.08	0.08	0
3	0.38	0.13	0.12	0.59
4	0.52	0.17	0.17	0
5	0.68	0.23	0.21	0
6	0.84	0.28	0.26	0
7	1.01	0.34	0.31	0
8	1.19	0.40	0.35	0
9	1.38	0.46	0.40	1.19
10	1.58	0.53	0.46	0
11	1.80	0.60	0.51	0
12	2.02	0.67	0.56	2.24
13	2.26	0.76	0.62	0
14	2.51	0.84	0.68	0
15	2.76	0.93	0.74	0
16	3.02	1.03	0.80	7.00
17	3.29	1.13	0.86	0
18	3.56	1.24	0.93	0
19	3.84	1.35	1.00	0
20	4.13	1.47	1.07	0

*actual = 50% stock, 50% bond for the years 1979–1998 (Ibbotson, 1999)

Source: Author's calculations, assumes the base contribution made at the beginning of the year and the supplemental contribution made at the end of the year.

vide some forms of guarantee that ERISA plans can't. In the Indiana Public Employees' Retirement System, for example, workers may choose a guaranteed rate of return in the defined contribution plan in which all covered workers must participate. In 1999, the guaranteed rate of return was 8.25 percent, which was set at one percent above the discount rate assumed in the associated defined benefit plan. All workers who participate in the defined contribution plan must also participate in a defined benefit plan. The guarantee is backed by the defined benefit plan fund.

The United Methodist Church offers participants the option of a minimum guarantee in its 403(b) defined contribution plan. The guarantee is backed by a reserve fund financed by investment earnings in previous years that were not credited to workers' accounts but were set aside for the purpose of backing the guar-

antee. That guarantee has been set at 6.5 percent for a number of years.

A Prototype Guaranteed DC Plan

How would an employer-backed minimum rate of return guarantee work? Such a guarantee doesn't rely on a reserve fund, an associated defined benefit plan, an insurance program, or an investment choice. Because the guarantee described here has limits, it's not an absolute guarantee, and is appropriately considered to be a risk-sharing arrangement.

The guaranteed defined contribution plan has three design parameters.

- 1. Individual accounts that receive contributions based on a contribution rate of 2 percent of the worker's salary.
- 2. A guaranteed minimum annual rate of return of 6 percent.
- 3. A guarantee backed by an additional annual contribution from the plan sponsor of up to 2 percent of a worker's pay.

The plan sponsor can vary the values of these parameters to make the plan more or less generous and the guarantee more or less secure.

If the prototype plan earns more than the 6 percent rate of return, the additional return would accrue to the participant. If the plan in a year earned less than the 6 percent guaranteed rate of return, the plan sponsor would contribute a supplementary amount, up to 2 percent of pay per worker, to raise the worker's rate of return to the guaranteed minimum. If the contribution of an additional 2 percent of pay were insufficient to raise the rate of return to the guaranteed minimum, the guaranteed minimum would not be met in that year, but no liability to the plan sponsor would be carried over to the following plan year. Thus, the guarantee may not be met in some years. For a more secure (and more expensive) guarantee, the liability could be carried forward one or more years.

The plan sponsor would choose plan investments. This feature is necessary to control the risk the plan sponsor is guaranteeing.

The Guarantee

Simple examples illustrate how the guarantee works. In the early years of a worker's participation, the likely cost to employers of the guarantee would be very low because the size of the worker's accumulated fund would be small relative to the worker's earnings. For example, if in the first year the plan earned a zero rate of return, at the end of the year, the employer would be required to contribute an additional 0.12 percent of salary (=2 percent X 6 percent) to raise the rate of return received to the guaranteed level of 6 percent.

Under a "bad case" scenario, in each following year the plan earns a zero rate of return. The calculations assume for simplicity that the worker's salary is constant. As shown in Table 1, after 12 years, the employer would be required to make the maximum contribution of 2 percent and the contribution would no longer be adequate to raise the plan's return to the

specified level of 6 percent. If instead the rate of return received by the plan each year were 4 percent, the employer would not be required to make the maximum additional contribution of 2 percent during the worker's first 20 years of participation in the plan.

I did calculations to investigate the effect of wage growth on the coverage of the guarantee. Wage growth has two effects. First, it raises the wage base, which increases the dollar amount of the supplementary contribution, pushing back the date at which the guarantee would fail. Second, it also raises the growth rate of the fund due to larger contributions, raising the required amount to cover any rate of return shortfall. The first effect predominates, reducing the required supplementary contribution.

A more realistic scenario, which takes into account annual variability in rates of return, assumes that the prototype plan had total investment returns each year equal to the average for large-company stocks and long-term corporate bonds. In the 20 years from 1979 to 1998, a portfolio composed each year of half stocks and half bonds would have earned less than 6 percent four times and less than 0 percent two times. In that period, the supplementary contribution would have been insufficient to cover the guarantee twice, but only after 12 and 16 years' participation in the plan.

If a more conservative portfolio is chosen (not shown), where 70 percent is invested in long-term bonds and 30 percent is invested in large-company stocks, the rate of return falls below 6 percent 5 times but only once is the supplementary contribution insufficient to cover the guarantee.

If the rate of return is sufficiently greater than the rate of wage growth, the protection of the guarantee is reduced for long-tenured workers as the plan account balance grows relative to the workers' earnings. In that situation, for a plan whose participants predominantly have long tenure in the plan, the plan sponsor may want to consider providing a higher additional maximum contribution rate in order to provide better coverage of the guarantee.

The failure of the guarantee depends on the rate of return, and the relationship between the plan assets and the workers' earnings. For example, if the portfolio earns a negative 10 percent rate of return in a year, after the first couple of years' participation the supplementary contribution of 2 percent generally won't be sufficient to raise the rate of return to the guarantee level. Thus, the pattern in the simulations of the guarantee always being met during the first decade of participation won't always be the case.

With the guarantee, employers who want to minimize their supplementary contributions to cover the guarantee will be motivated to maintain low-risk portfolios but with sufficient risk to achieve a high enough rate of return to cover the guarantee. Fortunately, this motivation is also in the interest of the workers, because they want assurance that the employer won't invest in an excessively risky portfolio. That would limit the risk that in

some years the extra contribution won't cover the guarantee because the portfolio has earned a sufficiently negative rate of return.

Advantages and Disadvantages

A guaranteed defined contribution plan feature has advantages and disadvantages, some of which depend on the characteristics of employers and workers. In all cases, the employer has the advantage of a known maximum contribution liability.

The expense to the employer can be reduced by requiring the employee to contribute all or part of the base contribution of 2 percent. The base contribution could be made as a matching contribution, where the employer contributed 1 percent for employees who also contributed 1 percent. The exact mix of employer and/or employee contributions for the base contribution doesn't affect the way the guarantee works, but it has important implications for who will partic-

ipate in the plan. If employee contributions aren't required, participation will be automatic. If they are required, some employees won't participate.

To give employers greater flexibility, the additional contribution could be made in employer stock or bonds. Employers also have flexibility in setting the maximum amount of the supplementary contribution, so long as they comply with maximum contribution rules.

This plan won't appeal to many workers, who would prefer more risk and greater expected return. Such workers tend to have higher than average incomes, so the plan may not appeal to plan sponsors whose main goal is to favor higher-income workers. This plan also may not appeal to employers and workers where the main plan is a generous defined benefit plan. In that case, the worker has two relatively low-risk sources of retirement income—Social Security and the defined benefit plan—and thus may prefer to have more risk in the supplemental defined

contribution plan.

Some employers may consider it a disadvantage that they would need to manage the plan investments. This would be necessary, however, so they could control the risk in the plans they were guaranteeing. Some employers may also find the uncertainty of the required amount of contribution to be a disadvantage in comparison with a money purchase defined contribution plan. Small employers in particular may not want to take on the added risk bearing in comparison with a traditional defined contribution plan.

A possible criticism of the plan is that it doesn't provide an absolute guarantee, having a positive probability of not meeting the guarantee. It's generally not economically desirable, however, to provide an absolute guarantee. Even workers who are relatively risk averse generally would rather take some risk to receive a higher expected rate of return. That point is demonstrated by the relatively low demand for a completely risk-free alternative-indexed bonds.

A related criticism is that while the guarantee provides more protection than workers have without it, the likelihood that it doesn't provide full protection increases with worker tenure. Long-tenured workers may prefer to switch to lower-risk portfolios as they near retirement, an option that could be combined with the guarantee.

The guaranteed defined contribution plan may be an appealing option to paternalistic employers or to employers who have had difficulty covering low-wage employees in voluntary plans. Such a plan is low-risk and relatively simple to understand. It may appeal to low-wage employees and other employees who have been traditionally difficult to cover under voluntary plans. It may also appeal to some workers who don't want the responsibility of managing their retirement plan investments.

Conclusions

Guaranteed defined contribution private pension plans would be less risky for workers for a given portfolio mix than traditional defined contribution plans because the employer would bear part of

the risk. Historical experience in the United States suggests that portfolios can be constructed so that in most years the employer wouldn't be required to make a supplementary contribution and that the guaranteed rate of return would be met or exceeded in nearly all years.

The likelihood of it not being met, however, increases after a decade or so of participation in the plan. The actual functioning of the guarantee depends on the volatility in financial markets, and if U.S. financial markets became considerably more volatile, the guarantee would fail more frequently than indicated in the simulations done here.

These plans don't provide an absolute guarantee, but they do offer the option of a defined contribution plan in which the financial market risk is partially borne by the employer. Their advantage is that they're targeted toward types of workers who typically have had low pension coverage rates. Those workers tend to be risk averse, and thus may tend to find the guarantee appealing.

These plans wouldn't be intended to replace other risk reduction strategies, such as shifting to a low-risk portfolio near retirement, but rather to supplement these strategies, providing an additional degree of flexibility for the pension system to meet the needs of workers and employers. ●

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