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Who Carries What Risks for Cash Balance Pension Plans?

by Thornton "Tip" Parker *

1. Introduction

Discussions of retirement plans that own stocks can be like promotions for home sites on the side of a volcano: They praise the view and ignore the risk.

Most retirement plans depend on stocks in order to build asset values faster than they could accumulate interest from investment-grade securities. "Everybody knows" that stock prices fluctuate, but because history shows that they smooth out over time, they are sound, long-term investments, particularly when inflation is considered. But is that what history really teaches us?

Oft-quoted analyses that show how stocks made money during almost all 10-year periods since the mid-1920s combine dividends and gains. But with most stocks now paying trivial if any dividends, the following points about gains are important.

- "In 1954, the Dow was 27% lower than it had been 25 years earlier."
- "In 1982, the Dow was 22% lower than it had been 16 years earlier."
- "The Dow doubled in the 53 years from 1929 to 1982" (Lein 2000, p. 58). Its compounded annual return from gains for that period was

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less than 1.4%. During much of the time, the gains were negative, and these numbers are current dollars.

Even that bit of history isn't much help when analyzing baby boomers' retirement plans because of the unprecedented effects that those plans have on prices. Accordingly, this paper ignores history because the past is irrelevant or misleading. It concentrates on who carries what risks if the national stocks-for-retirement cycle is fundamentally flawed and can fail as millions of boomers grow older (Parker 2000).

2. National Retirement Limits

Adults are expected to live longer all around the world. All developed countries that are members of the Organization for Economic Cooperation and Development (OECD) must face questions about what their older citizens will do with their extra years. OECD says that all its members will have serious social, economic, and political issues to resolve (OECD 1998). Beyond that, two writers have said that population aging can even threaten the European economic and monetary union (Ferguson and Kotlikoff 2000).

At the most basic level, retirement means continuing to consume while no longer producing. Each year, workers produce the national pie that includes nearly all the goods and services that they and retirees consume. Each person who retires simultaneously reduces the number of workers and increases the number of people whom the remaining workers must support physically, financially, or both.

Retirement plans provide purchasing power that retirees use to buy larger slices of the pie. Plans that depend on transfer payments from workers (e.g., Social Security) or on sales of assets to workers (e.g., stock-based retirement plans), simultaneously reduce the workers' purchasing power and increase both the retirees' purchasing power and the competition for the goods and services that workers buy. The more goods and services that go to retirees, the less there are left for the workers who produce them (Brown 2000).

If too many people try to retire, there can be more retirees than the remaining workers are willing or able to support. Nobody knows what the limits are, but most developed countries are approaching them and Japan may have exceeded them.

Retirement limits will probably increase three types of risk that employers, employees, retirees, and financial institutions will face in relation to retirement plans:

- *Financial system risk*—what can happen to stock prices if too many people retire and try to convert their gains into income.
- *Default risk*—the chance that an employer or carrier of a retirement plan may fail.
- *Longevity risk*—the possibility that retirees will outlive their financial assets.

3. Retirement Plan Risks

3.1 Financial System Risk

By trying to provide income to an increasing number of workers who may wish to retire when they meet preset age requirements, typically their mid-60s, America has let simplistic ideas about money and financial markets hide the fundamental question of how many retirees can be supported by workers. The country is trying to overcome macro physical limits with financial schemes that are usually viewed and managed at the microeconomic level. So far, nobody has explained how that can work.

As the physical limits are approached, their effects will show up in financial terms because that is what most people watch. That is happening now with Social Security, where the limits are being expressed in surrogate terms like “trust fund balances,” “tax rates,” and “long-term budget deficits.” These terms hide the underlying question of who will get how much of the pie that workers produce.

The financial problem is much bigger than Social Security. Ever since General Motors decided to use stocks to help pay for its defined benefit (DB) plan in the 1950s, the country has increasingly looked to stock gains to help people to retire (Drucker 1991). Despite several market cycles since then, gains have become the foundation of the retirement plans for millions of people. But no structure can be stronger than its foundations, so it is vital to understand the flaw in retirement plan foundations.

That flaw should be obvious. The primary assets of most retirement plans are stocks that pay small if any dividends. Stocks are just things the plans buy in hopes of selling at a higher price. They are one-time crops like carrots, pigs, and timber trees.

Design engineering teaches that no system is dependable if any of its critical components are not dependable. Retirement plans' most critical component will be adequate purchasing power to buy the stocks that they will have to sell at prices necessary to pay the anticipated incomes to retirees. Just as the three most important factors in real estate are location, location, and location, the three most important factors for retirement plans are buyers, buyers, and buyers—in that order.

The Federal Reserve Board's Flow of Funds data show that, for decades—and adjusted for stock splits—the total number of shares outstanding in the United States has actually declined. Almost none of the retirement savings that are used to buy stocks go to companies—they go to previous shareholders. Most buyers and sellers are just chasing themselves and a declining number of stocks around in an orbit that is entirely apart from the world where capital is used productively to create real wealth.

So who buys and sells stocks? Ignoring the high volume of short-term trading, where buying offsets selling and the money “stays in the market,” net additions of money come from people who have it—largely workers with discretionary incomes. For several decades, much of the “new” money has come into the market from workers in their peak earnings years and from their employers who were building up retirement accounts. The influx of retirement savings has chased a dwindling supply of stocks and inflated prices for 30 years. During that time, retirement account holdings have grown from about one-tenth to about one-half of all outstanding stocks.

For every buyer, of course, there is a seller. For each new dollar that comes into the market, somebody takes one out. Over the past 30 years, individuals have been the dominant, net sellers.

Many of the sellers were retirees, for whom inflated stocks were a boon. This is one reason why the economy has hummed along with low or even negative savings rates. Workers (and their employers) used retirement savings to buy stocks from retirees who spent the proceeds for consumption. When workers

transfer their purchasing power to retirees this way, the net effect is the same as if the workers just spent all their income.

The stocks-for-retirement cycle is running as it was designed to do. The minimal savings rates are an average of positive and negative savings. But what will happen when boomers retire?

Social Security offers a clue. In general terms, the concern is that, by about 2030, there may be only about 2.1 contributing workers to support each beneficiary. That seems a bit skimpy, so there are calls to use the program's funds to buy stocks because "everybody knows" that stocks return more than alternative investments.

But any funds that Social Security uses to buy stocks would become dead money unless the program intends to sell those stocks and use any gains to pay beneficiaries. After 2030, there is projected to be barely more than one worker in his or her peak earnings years per beneficiary to buy stocks that the program would sell. That is half the number of workers who may not be able to continue the program as it is.

Nobody has shown how privatization can work, and the burden of proof should be on its advocates to explain how it can. They must base their explanation on what can be expected to happen in the future, not what did or did not happen in the past. Nor can they implicitly base their explanation on hope. As the U.S. Army says, "Hope is not a method."

That brings us back to the country's physical limits. It appears that by 2030, when the youngest of the boomers will be over 65, and there may be only two Social Security contributors for each beneficiary, there will be scarcely more than one worker in his or her peak earning years, the time when people buy most of their stocks, for each person over age 65 (CIEBA 1999). If too many boomers try to retire, stock prices that were inflated by retirement plan purchases as they built up trillions of dollars of phantom wealth will be deflated by plan sales, causing the phantom wealth to vanish.

3.1.1 Phantom Wealth

Phantom wealth is an important concept. It is created by two actions. First, a trade of a relatively few shares sets the most recent market price. Second, all shares of that company's stock are marked-to-market, or treated as being worth the market price.

Consider this example. Assume a company has 100 million shares outstanding and a day's trading ends with the price per share 25¢ higher than the previous day. When all shares are marked-to-market, \$25 million appears to have been created. Where did the \$25 million come from? Nobody knows, but it is treated as a sound asset in pension plans, mutual funds, and retirement portfolios. If a subsequent day's trading ends with the price per share 25¢ lower, the \$25 million just vanishes—it was a phantom. Last year, by some accounts, \$3 trillion in phantom wealth took a walk, and that was without any fundamental cause such as the need to sell to pay retirement incomes.

If you are not familiar with the idea of phantom wealth, you have to turn it over in your mind a few times to grasp the tremendous multiplication effect that a few dollars worth trades can have on the values of retirement plan portfolios. As kids say, "It's unreal!"

But sadly and in another sense, it is very real. Phantom wealth is a large and, in many cases, the largest part of the foundations of most retirement plans. Just as infusions of new money into retirement plans have led to the creation of phantom trillions, reversing the process to pay retirement incomes can be expected to do just the opposite.

The resulting turmoil will affect both credit and equity markets when, according to OECD (1998), nearly all other developed countries will be facing serious problems in providing for their own aging populations. Nothing like that sequence of events ever occurred before, so stock gain projections for retirement plans that are based on market history are meaningless and misleading.

There is a serious risk that instead of being a formula for millions of boomers' retirements, the stocks-for-retirement cycle that depends on phantom wealth is a formula for a sustained bear stock market and even a depression.

In a later section, this paper considers how financial system risk, or the risk that the financial system may implode, can affect employers, employees, and retirees with DB, defined contribution (DC), and cash balance plans.

3.2 Default Risk

Stock price declines and disruptions of components of the financial system can ripple through the economy and do a great deal of damage even if the whole system does not fail. For example, if stocks are depressed for years in a sustained bear market, financial institutions like insurance companies and employers (including companies and units of government at all levels) that had expected to use gains to honor retirement commitments can find themselves overcommitted, insolvent, or bankrupt. This paper will consider in a later section how defaults by these organizations can affect the parties involved in DB, DC, and cash balance plans.

3.3 Longevity Risk

Because stocks that pay little or no dividends must be sold to convert any gains into retirement income, the sales must be stretched out over retirees' lives. Projections are routinely made for large groups of people of their life expectancies and the special services that older people may require such as medical care. But doing the same thing for an individual is like a golfer getting a hole-in-one. It can happen, but don't count on it.

Despite this fact, employer-sponsored retirement plans have been shifting toward individual self-sufficiency for years. In addition, millions of boomers and younger workers, who don't trust the government or their employers, believe they must rely on their own wits and have welcomed this shift. The financial services industry is building on these feelings.

But, as many retirees who are trying to manage their own assets are learning, self-sufficiency requires making the Impossible Decision—deciding how long one expects to live. The risks of under- and overestimating will be discussed later.

4. Risks and Retirement Plans

It is impossible to array in this paper all the perturbations of the three types of risk that are faced by all of the parties involved in the three types retirement plans. Analytically, they form a three-dimensional array, or cube, with sides for:

1. Types of retirement plans— DB, DC, and cash balance.
2. Parties— employers, employees, retirees, financial institutions, and the PBGC.
3. Types of risk — financial system, default, and longevity.

My intent here is merely to suggest a few of the most important considerations that realistic, due-diligence risk analyses should include.

4.1 Defined Benefit Plans

Employers that are obligated to pay retirees according to a specified formula carry most of the risks for DB plans. Whether they are businesses, state or local governments, or nonprofit institutions, they do the first level of worrying.

Employers will be affected by financial system risk in two main ways. First, if they expect stocks to help them pay retirement incomes and stock prices decline for years, they must get the cash they need to meet their obligations or default. This can cascade. Corporations that meet their obligations will reduce their earnings, which will reduce their stock prices, which will reduce portfolio values of all other retirement plans that hold their stock. State and local governments will have to increase taxes and/or reduce other services to meet their obligations. Most employers can expect their borrowing costs to rise. If some employers fail to pay their retirees, national income will go down which will reduce the general level of business, which will make it harder for all employers to sustain their operations.

It is likely that corporations' concerns over their pension obligations, which can threaten their long-term existence, are a major reason for the shift from DB to DC retirement plans.

The PBGC ensures that retirees will receive minimum payments if their corporate employers default on DB plan commitments. Based on retirement plan history and treating the phantom wealth that current stock prices have created as if it were a durable asset, the PBGC is said to be financially sound. That was also said of the Federal Savings and Loan Insurance Corporation before the S&L debacle led to losses beyond anything that had been anticipated.

If declining stock prices make many DB plans collapse and cascade, the S&L problem could seem like a warming-up exercise. See-through office buildings did have some value that could be recovered through liquidation, but it is not clear what the residual value of stocks may be, particularly if there is a financial system implosion.

Employees and retirees with DB plans believe they can enjoy a sense of security. Millions of them are financially unsophisticated. Some have their retirement benefits specified in union contracts, but many others have plans that their employers can cancel. The situations vary widely, but many employees who anticipate long and secure retirements may face severe setbacks if their employers default or if the country's financial systems contract.

DB plans have the advantage of being pools of workers and retirees. Employers that provide these plans assume the task of providing retirement income for as long as a retiree in the pool lives. When the plans work as they are supposed to do, retirees who don't take lump-sum payments can be spared of the longevity risk by not having to make the Impossible Decision.

The PBGC does not back up state and local plans, so if these plans default, their employees and retirees will be at the mercies of the politics of their jurisdictions. This could affect employees with retirement plans that, under today's evaluation techniques, are considered to be fully funded as well as those whose plans are already treated as underfunded.

4.2 Defined Contribution Plans

In terms of most risks, DC plans are mirror opposites of DB plans. The employer is responsible for contributing to each employee's account and the employee takes it from there. If there are serious financial dislocations such as a sustained bear market, stock losses in retirement accounts will primarily be the employees' and retirees' problem. If an employer fails and its retirement account

assets are properly segregated, little more should be at risk than the most recent contributions. Previous contributions are not the employers' money.

Because employers do not manage their employees' portfolios under DC plans, the financial institutions that do manage them will be the first to feel the shocks of market turbulence. Mutual fund companies' management fees, which are based on account balances, grew as contributions poured in and stocks were inflated. But declining prices will reduce inflated portfolio balances. Fund companies will have other serious problems and many may go out of business. There is early evidence that last years' declining markets led to this kind of contraction. No government organization like the FDIC or the PBGC insures the assets in portfolio accounts of these mutual fund companies.

Employees and retirees may put their savings into fixed annuities, and the insurance companies that sell these contracts are in a difficult position. They must promise returns that are high enough to compete with mutual funds in order to make sales, but they carry the first level of risk if their promises are too high. Here again, there is no backup to protect retirees if these companies fail as a result of their overestimating the ability of stocks to help them meet their commitments.

Employees and retirees carry some the greatest financial risks in the country under DC plans. Millions of people who have little financial understanding have been advised to buy stocks directly and through intermediaries. They have been told that building a retirement kitty is easy—it just takes an early start and perseverance. And from 1982 through 1999, that seemed to be true.

Very few of these people understand what can happen if too many boomers try to retire too soon. If, at any time during their retirement, stocks decline severely, they will watch their portfolio values shrink and they may be forced to reduce their standard of living or sell more than they planned in order to obtain income. This one-two punch can leave them in a financial hole or even destitute for the rest of their lives.

Not many employees really understand the Impossible Decision that their independence will eventually force them to make. Unless they sell their stocks and buy annuities, they will have to predict how long they will live and how

long they must stretch the stocks they will be selling. Even assuming that they will be able to sell their stocks for the gains they anticipate, if they underestimate their actual lives and sell accordingly, they can run out of assets before they die. If they overestimate their lives, money will be left for their survivors, but they will have lived more frugally than they might have. They will have lost either way.

To make matters worse, if they roll over their DC plan balances into IRA accounts, tax laws that treat everybody as having an average life expectancy set the liquidation parameters necessary to avoid tax penalties. The laws have been clarified and eased recently, but even if the stock market doesn't tank because of retirement sales, tax laws are likely to produce millions of destitute boomers who lived longer than they had expected.

4.3 Cash Balance Plans

These plans have elements of both DB and DC plans, often in different and even unique combinations. This limits the generalizations that one can make, but let's look at these plans by starting with the risks that are most likely.

Employees and retirees appear to have the same longevity risk as they do under DC plans if they receive their accumulated funds as a lump sum to manage when they retire. Unless employers provide annuities or they buy their own annuities from a supplier that can manage the actuarial issues, they must make their own Impossible Decision.

Most of the discussion about companies' conversions from DB to cash balance plans concentrate on investment strategies and how they will affect different age groups. The important issues involving self-sufficiency and the Impossible Decision have rarely been discussed.

Because cash balance plans are so varied and the role of PBGC is unclear, it is impossible to generalize very much about who carries what risks if an employer or financial institution fails or defaults. Who holds the plan assets and is responsible for their disbursement does appear to be an important point. If an employer has business problems, and if the assets and liabilities of the plan have not been protected by putting them "outside the fence" in some way, they may become part of the company's total assets for merger, buyout, or bankruptcy purposes. This could lead to heavy losses for the employees and retirees, particularly if PBGC does not protect them.

For example, an employer might establish notational accounts for its employees and credit them with periodic contributions and interest payments without establishing an outside trust to hold the assets. If troubles come and the assets are not held beyond the reach of general creditors, employees and retirees might just take their place in line with all other creditors. In that case, employees and retirees might have much greater risks under cash balance plans than they would have under DC plans where the money goes to another institution for safekeeping and management.

From a risk standpoint, stocks are the big joker in cash balance plans. The reason for this can be seen in the Society of Actuaries report "Actuarial Aspects of Cash Balance Plans." (Lowman, 2000). An appendix to the paper says that a thousand Monte Carlo simulations were run to show how various combinations of stocks and interest-bearing instruments would affect cash balance plan investment returns. The simulations were based on investment experience from 1926 to 1998.

In my opinion, that approach has three big weaknesses. First, it is based on the assumption that what happened during any of those years, or in any 20-year period during that time has a significant chance of being repeated during the simulated future. But that can only be true if, during those years, there was a period when about half of the stocks of the country were sold to a relatively dwindling number of workers to pay retirement incomes at the same time most other developed countries were facing severe social, political, and economic problems in providing for their own aging populations.

Second, prior to the 1970s, stocks provided significant returns as dividends. Now the returns are expected to come largely or entirely from gains. If the frequently used data that purports to show how stocks have done were disaggregated to show the returns from dividends and gains separately, during much of that 70-plus-year period, the returns would be shown to have come predominantly from dividends during the earlier years and from gains more recently. If simulations used periods of sustained stock price declines like those mentioned at the beginning of this paper, without diluting them with dividends, they would produce completely different and more realistic results.

Conversely, if the simulations were based on dividend data, they would show that few stocks have any place in retirement portfolios today. There is no way to predict what will happen if stocks in retirement plans either do or do not

revert to providing returns primarily from dividends. Based on what we can know today, however, there is little reason to believe that the investment history of 1926–1998 will repeat itself unless the two types of returns are treated separately.

Third, regardless of how sophisticated the simulation technique may be, projecting the future of a single retirement plan by itself is like predicting how fast someone can swim into a harbor without knowing the direction of the current. The swimmer may be able to float in if the tide is flooding, but not get in at all if it is ebbing.

Despite the experience of 1972–74, when stocks in some pension plans lost up to half of their value, the history of stock-based retirement plans has largely been written when the tide was coming in and the current was favorable. But when the tide begins to ebb, there will be an entirely different situation. One of the simulations done for the SOA paper was based on the investment data for the 20-year period from 1979 through 1998, when incoming tide produced S&P 500 annual returns of 18.45%. One way to simulate a 20-year period when the tide is going out might be just to reverse the signs.

The best, and perhaps only realistic approach is to project what the sum of all retirement portfolios in the country are likely to do, and use that overall prediction as a guide for evaluating individual plans. In other words, look at the current first, then the swimmer. Instead of using Monte Carlo techniques for specific plans, it would be wiser, and I believe much easier, to do supply/demand analyses for the sum of all stock-based retirement plans in the country. When all is said and done, it will be the sum of all supply and demand actions that will determine what happens to all stock-based retirement plans.

Unlike DB or DC plans, there is no simple answer to who carries the risk if equities are involved in cash balance plans. With some plans, the interest credits, and maybe even the balances are tied to equity indices. In these cases, the employee carries the risk of stock price declines as with a DC plan.

In other cases, employers use equities to earn more than the credits that they have promised to the employees. In these cases, the employers carry the initial risk. If, however, these employers keep the plan assets “inside the fence,” they increase the employees’ and retirees’ exposure to the risk that if the employer goes bankrupt, the plan assets may become subject to the claims of all creditors.

My final concern about the risks of cash balance plans and who carries them is based on their complexity. As the SOA paper shows, not only are companies using cash balance plans to provide benefits to their employees, some of them are also trying to make money by using stocks to increase their investment returns.

But few managers, investors, employees, retirees, or regulators can understand how specific plans are intended to work. There is a serious risk that this type of financial engineering can lead to unanticipated problems like the bets and derivatives that led to the Long-Term Capital Management fiasco (Chancellor 1999, Morris 1999).

This seems particularly serious if, as I believe, all stock-based retirement plans have a fundamental flaw that will surface when boomers' retirements really begin to test them by selling stocks. Instead of using Monte Carlo techniques, we may be playing Russian roulette with all chambers loaded.

5. Recommendations

I made five recommendations in my paper, "Can The Stocks-for-Retirement Cycle Work," that I presented at the SOA Retirement 2000 Symposium (Parker 2000). I stand by them and repeat them here:

- Pick this paper apart. If it has weaknesses, identify and publicize them. If, however, its basic message about the national stocks-for-retirement cycle is sound, take the message seriously and recognize the pivotal role that actuaries play as trusted seers into the future.
- Do (in conjunction with professional societies) a 70-year, due-diligence analysis of the national stocks-for-retirement cycle based on population and economic assumptions like those that are used for Social Security. Treat the sum of all retirement plans as a single portfolio and project the returns that it should expect to receive from stocks on the basis of the supply and demand conditions that are most likely to exist when boomers begin to sell stocks for income.

- Use that analysis of the national cycle for projecting returns from individual retirement account and pension plan portfolios. Treat each portfolio as a component or subset of the national cycle, not as an independent entity.
- Treat stock portfolios as inventories that are bought to be sold at a profit and ignore stock price history. Avoid recording paper gains and predicting their future values by using compound interest-like formulas. Either value portfolios at cost, market, or anticipated selling price, *whichever is lower*, or as being within high-low ranges of possible values.
- If you conclude that the cycle presents serious risks, consider the possible professional and legal consequences of not warning your clients and the public about them.

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