

Pension Rate of Return Guarantees in a Market Meltdown

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The financial market meltdown in 2008 has raised questions about the security of retirement income. Defined contribution plans are providing an increasing share of retirement income in many countries, but workers participating in them bear financial market risk. A key characteristic that sets defined contribution plans apart from more traditional defined benefit plans is their treatment of investment risk: defined contribution participants bear all investment risks, while those risks are borne by the plan sponsor in defined benefit plans.

Out of concern over risk bearing by workers, some policy makers and plan sponsors have reduced the risk to workers by adding rate of return guarantees. These guarantees take a number of different forms. They vary by level, whether they are real or nominal, duration of the period over which the rate is guaranteed, duration of the period over which the guaranteed rate is calculated, whether the guarantee is fixed or relative to an index, and whether the guarantee is for a fixed amount or is a minimum.

In less than ten years, there have been two major periods of stock market declines. The first lasted for three years, starting in 2000. The started in late 2007 and continued through early 2009 before reversing. These two periods have tested the ability of financial institutions to provide rate of return guarantees on pension plan assets. From March 2000, when it peaked at slightly above 5000, until October 2002 when it fell to nearly 1100, the NASDAQ in the United States lost almost 80 percent of its value. In an attempt to reverse the economy's slide, the Federal Reserve lowered its target for the federal funds rate eleven times in 2001, from 6.5 to 1.75 percent, and then lowered it twice more in November 2002 and June 2003, down to 1.0

percent. Out of the past two decades, the pattern of a falling stock market and falling interest rates only occurred in 2001 and 2002.

Five years later, U.S. equity prices fell precipitously again, with the Dow Jones Industrial Average losing more than half of its value from October 2007 to March 2009. Stock markets in OECD countries fell about 45 percent in 2008. A study from the OECD found that worldwide private pension funds lost 23 percent of their value in 2008, a loss of US\$5.4 trillion (OECD 2009).

Most pensions are not invested entirely in stocks, and the amount in stocks varies across countries. The real rates of return on pension funds in 2008 averaged -37.5 percent in Ireland, -26.7 percent in the US, -12.6 percent in Switzerland and -8.5 percent in Germany (Table 1) (OECD 2009).

Insert Table 1 about here

This paper surveys the effects of the decline in world stock markets over the three years starting in 2000 on rate of return guarantees in pension plans. It also examines more recent evidence during the downturn that started in late 2007. It examines the experience of plans with guarantees that are fixed in nominal or real terms. Specifically, it addresses the following four questions:

- How durable are fixed rate of return guarantees?
- In what ways have guarantees changed since 2000?
- For the subset of plans that have maintained relatively generous guarantees, how have they managed to do that?
- What are the characteristics of new guarantees started since 2000?

The paper considers fixed rate of return guarantees in the accumulation phase. It examines the financing of these guarantees to determine how some plans have been able to maintain guarantees in the face of stock market declines over the past decade.

Previous studies have surveyed mandatory defined contribution plans providing rate of return guarantees (Turner and Rajnes 2001) and voluntary defined contribution plans providing rate of return guarantees (Turner and Rajnes 2003).

Rate of Return Guarantees

Rate of return guarantees can have a number of different features that affect the extent of the risk reduction they provide for pension participants, and their cost to providers. For all of them, either a rate of return is determined in advance, or the mechanism (external to the plan investments) by which the rate of return is determined is set in advance.

Relative or Fixed Guarantees. Rate of return guarantees can be variable, set as a minimum relative to an index, or can be for a fixed minimum rate of return. Variable rate of return guarantees are tied to an index and move along with the index. Plans that have adopted a relative guarantee tend to be a privatized component of a social security system (Rajnes (2002)). For example, in Chile the rate of return guarantee is provided relative to the rates of return earned by all the pension fund management companies. Poland and the Slovak Republic also are examples of countries with relative rate of return guarantees.

This study focuses on fixed rate of return guarantees because they are potentially costly during a financial market meltdown. The plans we consider include provident funds, nation-wide employment based systems, publicly-managed pension funds, and pension funds of non-profit organizations. In some countries, all defined contribution plans are required to provide such a guarantee, but in those cases the guarantee is usually a zero rate of return (guaranteed principal).

With a fixed rate of return guarantee, the plan provider guarantees either a minimum rate of return or a fixed rate of return. With a minimum rate of return, if the investments earn higher, the participants receives some or all of the excess. With a fixed rate of return, if the investments earn higher, the excess goes to the plan provider. This approach provides a hedge and is like selling a “collar” (Feldstein and Ranguelova 2001). The hedge aspect is that the workers give up returns above the guaranteed level in exchange for not getting returns below that level. The individual in effect sells a put option and buys a call option.

These guarantees can be defined in nominal terms, for example a guarantee of 5 percent, or they can be defined in real terms, for example a guarantee of 3 percent real (above inflation). If the inflation rate were also 3 percent, this would be equivalent to a nominal guarantee of 6 percent.

Term of the Guarantee. Fixed rate guarantees differ as to the term over which they are fixed. Some guarantees are reset annually or every six months, while other guarantees are fixed for a period that is not predetermined and is expected to last for years, and others are changed as needed, with the expectation of changes every few years. When plans set a fixed nominal interest rate as the guarantee rate, their ability to guarantee that rate is affected by the level of rates of return in financial markets, which is affected by the inflation rate. Thus, a higher level of guarantee is appropriate during periods of relatively high inflation and high nominal rates of return than is appropriate during periods of lower inflation. A nominal guarantee that is adjusted with respect to the level of financial market returns can resemble a real guarantee. The shorter the term, the more the guarantee takes on the characteristics of a variable rate guarantee. Some guarantees at low rates, such as zero percent, are indeed fixed with little probability presumably that they will be changed.

Level of the Rate of Return Guaranteed. Guarantees differ as to their level of generosity. A guarantee of return of principal is a zero percent nominal guarantee and a negative real guarantee when inflation is positive, due to the effect of inflation. Such guarantees are catastrophic guarantees. They guarantee that a catastrophic decline in the workers account balance will not occur. By contrast, a guarantee of 3 percent real is a higher rate than can be provided through risk-free investments in most countries, and thus involves a subsidy from the provider when the provider is risk averse.

Testing Period for the Guarantee. An additional parameter of guarantees is the frequency with which they are applied. It could be required that the guarantee be met every year. For example, it could be guaranteed that the plan will earn 3 percent real every year of the person's participation. A less stringent requirement is that the guarantee only be applied at retirement or on changing jobs. For example, it could be guaranteed that at retirement the geometric average rate of return over the worker's entire period of participation was at least 3 percent real.

The Cost of Guarantees

A guarantee of the risk-free rate of return can be funded by investing in risk-free government bonds, and thus can be provided at zero cost to the provider, other than administrative costs. The pension participant pays an implicit cost in terms of a reduced expected rate of return. There is thus a tradeoff between risk and return, as occurs normally in financial market investments.

A fixed rate of return guarantee above the risk-free rate of return can be costly to provide. In the United States, the risk-free real rate of return is about 2.5 percent real. Biggs (2008) and Munnell and others (2009) have both calculated that a guarantee of 3 percent real would cost the guarantor over a period of 20 years an amount equal to approximately 25 percent of

contributions, assuming the guarantor has a level of risk aversion equal to the market average and thus would require some compensation for bearing risk. Thus, it would cost the guarantor 25,000 euros to guarantee a 3 percent real rate of return on contributions of 100,000 euros made in year one and held for twenty years. An alternative approach examining historical data and providing the guarantee as the geometric average rate of return over a career, rather than an annual rate of return, found that a 3 percent real guarantee could be provided costlessly, based on U.S. historical data. However, the historical data reflects only limited experience, and the studies cited earlier provide better estimates (Munnell 2009).

The cost of a low guarantee, such as zero percent, in the face of a 30 percent decline in the stock market, can be substantial if the insurer has invested in stock. The cost estimates discussed here assume that the insurer has optimally invested the fund.

The actual cost of guarantees when provided by life insurance companies is substantially higher than indicated by the above studies. With an option called “living benefits”, the insurer, for a fee, guarantees that the value of the account will not fall below the amount contributed to it, thus also providing a guarantee for the amount that can be annuitized. While variable annuities tend to charge relatively high fees, averaging more than 2 percent of assets per year, these guaranteed products can be expensive, with fees up to 3 percent of assets per year. Prudential offers a variable annuity with a guaranteed rate of return of 5 percent, but it charges an extra fee of 2 percent of assets for that guarantee (Tergesen 2008).

The estimated cost of a rate of return guarantee depends on the probability of receiving low rates of return. Thus, the “fat tails” problem is relevant. The fat tails problem is the problem that standard assumptions as to the distribution of future rates of return may underestimate the probability of low (negative) rates of return. The left tail of the probability distribution of rates of

return may be fatter than has been assumed (Laise 2009). If that is the case, then standard models of the cost of rate of return guarantees have underestimated the cost.

Another important aspect of rate of return guarantees is the institution providing them. If they are provided by a private profit-making entity, and provided at more than the risk-free real rate, the risk of bankruptcy of that entity with insufficient backing of the guarantee is inherent. For this reason, some guarantees may require government backing. If the government is less risk averse than the market, it may be better able to provide a guarantee.

For descriptive purposes, guarantees can be divided into three levels of generosity:

- First, guarantees of nominal principal imply a zero nominal rate of return and a negative real rate of return due to inflation.
- Second, rate of return guarantees below the risk free rate but above zero imply a guarantee of a positive nominal rate of return. Some of these in effect provide a guarantee of real principal by picking a rate that is close to the typical inflation rate for the country.
- Third, rate of return guarantees above the risk free rate of return imply a subsidy from the guarantor when the guarantor is risk averse. While the risk free rate of return varies across countries, it is assumed to be a real rate of 2.5 percent, with an assumed inflation rate of 3 percent causing the nominal rate to be 5.5 percent.

Because guarantees tend to change over time, in categorizing plans we use the guaranteed rate as of 2000.

In surveying guarantees around the world, we first consider plans in the U.S. then consider plans in other countries (Table 2). In each section, we divide the guarantees into those that are a guarantee of principal, those that are less than 5.5 percent nominal, which is our rough

measure of the real interest rate, and those that are higher. In addition to the plans and countries discussed in the text, other plans and countries are discussed in the Appendix.

Insert Table 2 about here.

Fixed Rate of Return Guarantees in U.S. Pension Plans

Pension plans in the United States account for more than half of pension assets in the OECD (OECD 2008). This section surveys U.S. pension plans that have provided fixed minimum rate of return guarantees during the accumulation phase. We examine how they reacted to the prolonged stock market downturn starting in 2000 and to the market downturn starting in 2007.

Private sector defined contribution plans covered by the Employee Retirement Income Security Act (ERISA), the main pension legislation in the United States, are required to credit to participants all the investment earnings received on their accounts. This requirement prohibits setting up reserve funds, where excess rates of return in some periods are saved to be credited in later periods in order to fund a guarantee. Because of this prohibition, these types of guarantees are not found in private sector plans covered by ERISA, but are only found in the United States only among state and local government plans and church plans. Thus, the U.S. evidence cannot be interpreted as indicating that governmental entities are more likely to provide guarantees than private sector entities.

Cash balance plans are hybrid plans that are classified in U.S. pension law as defined benefit plans. However, from an economic perspective, they are equivalent for workers to defined contribution plans with a rate of return guarantee. Many of these plans provide a rate of return that is tied to an index. Those plans are not considered in this paper. However, any plan

that provides a flat rate of return guarantee is in effect a cash balance plan, and those plans are considered. We consider U.S. public sector pension plans, and plans provided by churches and other non-profit organizations.

Deferred Retirement Option Plans, also referred to as Delayed Retirement Option Plans, or DROP plans, are peculiar to the public sector in the United States, where they have enjoyed increasing popularity. A DROP plan is an arrangement under which an employee, who would otherwise be entitled to retire and receive benefits under an employer's DB retirement plan, continues to work (Calhoun 2000; Chittenden 2000). The typical DROP design entails an option that can be exercised by employees only when they are eligible for retirement (OPERS 2004). If employees choose the DROP option, they continue to work for that employer. As the DROP period begins, the annuity that the participant would be eligible to receive goes into an individual account rather than to the DROP participant. Some DROP plans earn interest, while others do not. DROP periods are typically one to five years in length. At the end of the DROP period, most DROP plans permit the participant to be paid the accrued amount as a lump sum, rolled over into an IRA or similar tax-deferred account or some combination of the two options.

Guarantees of Principal

Louisiana. The State of Louisiana has a DROP plan, an acronym that stands for Delayed Retirement Option Plan [but is also called Deferred Retirement Option Plan in some states]. That plan contains a guarantee. Instead of terminating employment and accepting retirement benefits, employees choosing the plan continue working for up to 36 months. For those who became eligible for retirement before 2004 and participated in DROP, benefits from the defined benefit plan during the DROP period were placed in an individual account that earned a rate of return equal to the actuarial rate received by the plan's investment portfolio less an

administrative fee of 0.5 percent. There is a guaranteed minimum rate of return of zero percent, which was paid for the plan years 2000-01, 2001-02, and 2002-03 (Teachers' Retirement System of Louisiana 2009). [For the year ending June 2001, those funds earned a minus six percent rate of return, but workers received the guaranteed rate of zero (Chambers 2002).] The State of Louisiana provides the financial backing for the rate of return guarantee. In February 2009, the plans announced that for the year ending June 30, 2008, it would provide a rate of return of 7.99 percent, following credited rates of 13.71 percent in 2007 and 12.46 percent in 2006 (Louisiana State Employees Retirement System 2009).

In 2003, the Louisiana Legislature changed the investment details of DROP funds for workers who became eligible to enter DROP beginning January 1, 2004. The change effectively reduced the cost of the guarantee. As a result, a new interest-bearing DROP account was implemented, which is referred to as a Liquid Asset DROP (LaDROP). LaDROP accounts are credited interest at the "liquid asset money market rate" less a 0.25% administrative fee. Liquid asset money market rates are approximately the same as passbook savings account interest rates, and thus are considerably less than the rate of return earned in the stock market in many years. As of June 30, 2008, DROP accounts for employees who joined on or after January 1, 2004, earned approximately 3.98 percent per annum, compared to 7.99 percent for participants who had been grandfathered into the earlier version of the plan.

Guarantees Below the Risk Free Rate of Return

Los Angeles. Since May 1, 2002, the Los Angeles Fire and Police Pension Plan (LAFPP) has offered public safety staff in Los Angeles a Deferred Retirement Option Plan (DROP) option with a guaranteed rate of return. This is a voluntary program that allows individuals to work and receive pay and benefits as an active employee while accumulating pension payments credited to

a DROP account. Funding for this program comes from the defined benefit LAFPP plan. To be eligible to enter DROP, the worker must be on active duty and meet the years of service and/or age criteria for retirement. Qualified individuals may participate in DROP up to a maximum of 60 months (5 years). Individuals enrolled in DROP are considered retired for purposes of earning further service credits in the defined benefit plan. In other words, an individual's service accrual and all their eligibility conditions are frozen on the date she/he enters the DROP plan. While in DROP, accumulated monthly pension payments are credited an annual guaranteed interest rate of 5 percent. Exit from the DROP plan may occur at any time up to 5 years from entry into the program and coincides with formal departure from employment. At the end of the DROP period, the individual is officially required to retire and begin receiving their service-based defined benefit pension based on salary and years of service at the time they entered the DROP. The individual can then receive the accumulated DROP account balance in either a lump-sum payment or rollover the funds into a tax-qualified plan (LAFPP 2009).

Texas. In 1981, government employees of three Texas counties--Galveston, Matagorda and Brazoria-- withdrew from Social Security.² The three counties replaced the Social Security program benefits for their workers with a system of individual accounts known as the Alternate Plans.³ These plans provide employees a guaranteed minimum nominal rate of return of 4 percent, with workers and the insurance company sharing rates earned above that. To do this, managers of the Alternate Plans purchased Group Fixed Annuity Contracts from a private insurance company, the American United Life Insurance Company. The portfolios holding the plans' contributions are invested only in fixed-rate marketable securities--government bonds,

² Before the Social Security Act was amended in 1983, state and local governments that had previously participated in Social Security were permitted to opt out.

corporate bonds, and preferred stocks, as well as bank certificates of deposit (GAO 1999). The annual interest rate earned on Galveston's investments averaged 4.6 percent real or 8.6 percent nominal for the years 1981-98 (Wilson 1999). The average annual rate of return for Galveston's investment from 1981-2005 was about 6.5 percent nominal (Holbrook 2005). According to the plans' administrator, the current interest earned in mid-2009 was approximately 4.25 percent nominal (Gornto 2009).

YMCA Retirement Plan. The YMCA Retirement Plan is a money purchase, church pension plan with a nominal interest rate guarantee set twice a year by the Board of Trustees. Historically, a minimum rate of 3 percent nominal has been credited to participant accounts, although the interest rate credited to accounts is often higher. The plan maintains its guarantee through use of a contingency reserve and the acceptance of periods of unfunded liability.

In 2000 and 2001, the fund paid 10 percent interest rate credit on participants' accounts, but reduced that rate to 5 percent in 2002. In 2002, the plan experienced an unfunded liability, having liabilities greater than assets. In 2003, the YMCA maintained an interest crediting rate of 5 percent. In 2009, the Board of Trustees shortened the period over which it promised a set guaranteed rate from 6 months to 3 months, and it reduced the crediting rate to 1 percent. Even though the investment fund lost money during the financial meltdown in 2008 and 2009, participants were credited with a positive amount, and did not lose any money (YMCA 2009).

Guarantees Above the Risk Free Rate

Florida. Since July 1998, the State of Florida provides a Deferred Retirement Option Program (DROP). This program has allowed state employees to effectively receive retirement benefits without terminating their employment for up to 5 years (8 years for teachers under

³ The Alternate Plans are a secondary source of retirement income for these workers in the three Texas counties. Their primary retirement benefit is provided under the Texas County and District Retirement System, another

certain circumstances). During that time, their retirement benefits continue to accumulate in the Florida Retirement System (FRS) Trust Fund and earn interest compounded monthly at an effective annual guaranteed rate of 6.5 percent. The program is available to eligible members of the Florida Retirement System who are in the FRS Pension Plan—the defined benefit pension plan option. It is also available to eligible members of the Teachers' Retirement System (TRS) and the State and County Officers and Employees' Retirement System (SCOERS)—defined benefit plans that were closed to new members when the FRS was created in December 1970.

When the DROP period ends, program participants must terminate employment. At that time, participants receive their accumulated DROP benefits and begin receiving a monthly retirement benefit, as calculated upon retirement when they entered the DROP program, plus any applicable cost-of-living increases (Florida 2009).

Indiana. Employees under the Indiana Public Employees' Retirement Fund (PERF) receive a defined pension benefit and a defined contribution benefit, known as the Annuity Savings Account (ASA). ASA is a tax-deferred individual account that grows through mandatory, and possibly voluntary, contributions. Under the PERF plan, at least 3 percent of an employee's salary must be contributed to his or her ASA. Employees may contribute up to an additional 10 percent of their salary. The Guaranteed Fund is one of six investment options available to PERF participants for the ASA account. Other investment options include a Money Market Fund, Bond Fund, S&P 500 Stock Index Fund, U.S. Small Companies Stock Fund and an International Equity Index Fund.

Guaranteed Fund assets are invested according to the asset allocation of the Defined Benefit Plan as approved by the PERF Board of Trustees. Guaranteed Fund investments include

defined contribution plan, which also provides disability and survivor benefits (GAO 1999).

bonds, large capitalization stocks, small capitalization stocks, and other types of diversified investments. According to the Board, market conditions did not allow the same level of return in 2009 as in 2008. PERF's Guaranteed Fund will earn an annual return of 3.5 percent beginning July 1, 2009. Previously, this investment option paid 6 percent. The rate is set annually by PERF's board of trustees. From 1998 through 2002, the annual credited rate of return was 8.2 percent. That rate declined steadily to around 6 percent through 2008, before the most recent decision to cut the rate by nearly half.

Montana. The Public Employees' Retirement System Defined Contribution Retirement Plan (PERS-DCRP) in Montana was implemented in July 2002 as an employee alternative to the traditional Defined Benefit Retirement Plan (DBRP) for state, university, local government and certain school district employees (MPERA 2009). The DCRP is a 401(a) plan with an individual account that allows members to invest in a Stable Value Fund as one of 15 different investment options. The Stable Value Fund, also called the Fixed Fund, is a bond account which is invested and managed by the Pacific Investment Management Company (PIMCO) and insured by Aegon. A 457 Deferred Compensation Plan⁴ is offered to members of both the DCRP and DBRP plans, which allows employees to voluntarily contribute a portion of their compensation on a pre-tax basis and invest those contributions on a tax-deferred basis, including a stable value fund as one investment option. Because these stable value funds are invested in bonds, they are subject to market volatility. However, Aegon, the insurer of the funds, guarantees that in spite of the ups and downs, plan participants who choose this stable value option will receive both their original principal amount as well as the quarterly credited rate.

⁴ A 457 plan is a type of defined contribution plan, similar to a 401(k) plan that is available to governmental employees.

When Aegon sets the quarterly rate, it ‘smoothes’ the actual rate of return using the duration of PIMCO’s portfolio.⁵ This allows participants to see a more consistent credited rate rather than using an actual high rate one quarter and a low rate the next quarter. These rates are significantly higher than many other fixed income products, primarily due to Aegon’s ‘smoothing’ process. The process will generally result in any decline being more gradual; it also results in a more gradual increase in the credited rate when market conditions improve. The process reduces the immediate impact of market conditions.

Since the floor for the credited rate is zero percent, participants in the stable value funds do not experience a negative return or loss of principal. The credited quarterly rate for the 401(a) plan was initially set at 4.7 percent in 2002 and was set at 6 percent in the third quarter of 2009. In the interim, the credited rate rose to 5.1 percent in the third quarter of 2003, fluctuated at levels around 3 and 4 percent for a time until peaking at 6.7 percent in the second quarter of 2008. The credited rate for the latest quarter (3rd quarter of 2009) is 6 percent.

Ohio. In 2001, the 401(a) plan⁶ of the Ohio State Teachers’ Retirement System began providing a guaranteed 7.75 percent annual rate of return backed by the system’s defined benefit plan. Participants choosing the option in future years may be offered a higher or lower guarantee. In 2003, the guarantee was lowered to 6.5 percent. The rate is reset annually, but as of 2009 is 6.5 percent. This Total Guaranteed Return Choice is one of the options provided by the plan to its participants. It is backed by a diversified portfolio, including foreign and domestic equity, bonds and money market instruments.

The guarantee is offered to participants who leave their money in the option for at least five years. This restriction reduces the problems of managing cash flow in the plan because it

⁵ A more detailed explanation of this investment process is available in the Appendix of the Montana Public Employees’ Retirement Board’s *Financial-Compliance Audit*, December 2008.

reduces the extent to which workers enter and leave the plan. Workers who withdraw from the option before five years must pay a 10 percent penalty. Thus, the guarantee and penalty provide an incentive for workers not to change their investment options and, instead, to stay within the plan for at least five years.

Because the defined benefit plan and the defined contribution investment are expected to earn 8 percent annually, after a 25 basis-point administrative cost, the guarantee has been deemed costless over the long-term for Ohio's taxpayers (Gold 2002). That analysis, however, ignores the risk involved in the investments compared to the risk-free nature of the liability to the participants.

The asset allocation of this investment portfolio parallels that of the system's defined benefit plan. Any shortfall will be made up from the funds of the defined benefit plan. Any excess will be placed in the defined benefit plan (Kennedy and Jacobius 2001).

The defined benefit plan guarantees that there will be sufficient funds to pay the guaranteed rate of return. Since workers are free to choose this option or alternative options, the workers choosing the option presumably pay no implicit (and clearly no explicit) insurance premium.

Oregon. In the Public Employees Retirement System (PERS), employees hired before 1996 are guaranteed an 8 percent annual nominal return on their regular pension accounts. Up until 2003, there was no cap on the rate of return that participants could receive and the 8 percent guarantee was a minimum guarantee. Starting in 2003, the generosity of the terms of the guarantee was reduced so that the guarantee is for a fixed rate of return of 8 percent. This change reduced the plan's unfunded liability of \$14.8 billion by \$900 million (Schneyer 2003).

⁶ A 401(a) plan is a type of defined contribution plan similar to a 401(k) plan.

The guarantee is gradually being phased out since it does not apply to employees hired since 1996.

The financial backing for the guarantee is a reserve account fund. With the stock market downturn, the PERS reserve account for providing the guarantee during market downturns has been depleted, so state agencies have been required to make up the difference. This plan thus proved to be expensive as a result of the 2000 stock market downturn, and a bill was introduced into the state legislature to end the plan, but instead the cap was placed on the guarantee. In 2003, the State of Oregon attempted to eliminate the guarantee. However, the State Attorney General wrote an opinion that such a change would likely be viewed as “an unconstitutional impairment of contract rights” (Adams 2003).

United Methodist Church. Church plans in the United States are subject to fewer constraints than are most other private sector plans and are able to provide guarantees that other plans are not legally permitted to provide. A guarantee called the base interest credit for many years was provided by a plan the United Methodist Church sponsors. The level of the base interest credit was declared annually by the General Board of Pension and Health Benefits, but was constant for long periods of time. The guarantee for this plan was backed by a reserve fund financed by part of the rate of return received on the fund in years when the rate of return exceeds a fixed amount-- 6.5 percent for many years. Ultimately, the guarantee was backed by the Church. The rate of return guaranteed was reduced to 3 percent in 2001 and to 0 percent in 2003, and the guarantee was subsequently ended. If the actual rate of return exceeded the guaranteed rate of return, the excess rate of return was deposited into the reserve fund. Twice a year, the reserve fund was evaluated, and if it exceeded the target level, an extra distribution was made to the accounts of participants. The plan could credit a rate of return higher than the

guarantee even if the actual return received in a year is lower if the reserve fund was sufficiently large.

The reserve fund consisted of assets of the pension fund that were not allocated to participants' accounts. They were assets that exceeded the obligations of the plan. The target level of the reserve fund was set as a percentage of the assets to be guaranteed, which was 18 percent of assets for the 3 percent rate of return guarantee. The reserve fund was set so that in most years it would be adequate to compensate for a fall in the value of the assets in the portfolio of the pension fund. However, there was a small probability that the reserve fund would not be large enough to fund the guaranteed rate of return in a year.

In the Methodist Church plan, if the reserve fund was completely depleted, as happened in 2002, the plan had an unfunded liability. That situation could arise when the reserve fund has been exhausted and the total asset amount credited to workers' accounts exceeds the total assets in the fund. This is not a problem for short periods so long as the fund has sufficient assets to meet its cash flow requirements for benefit payments.

Over the long term for workers who are not nearing retirement, the effect on participant account balances of a rate of return guarantee provided by a reserve fund is unclear. The total credits paid to participants depend on the investment returns received by the pension plan. However, over the short term the guarantee does affect the level of credits, and may be a particularly valuable feature for workers nearing retirement, who are assured that they will have a guaranteed minimum asset account balance at retirement.

A reserve fund, such as was used by the Methodist Church, allows for rate of return smoothing over time. The guarantee is financed by the participants of the pension fund, since the reserve fund is made up entirely of investment earnings on the plan assets that have not been

allocated to the accounts of individual workers. A reserve fund financed by investment earnings is not permitted by the Employee Retirement Income Security Act of 1974 (ERISA) because it stipulates that all investment earnings in defined contribution plans must be allocated to the accounts of the individual participants.

International

Guarantees of Principal

Germany. Pure defined contribution plans have never been possible in Germany because there has always been a requirement of a minimum rate of return guarantee. Starting in 2002, Riester pensions, named after a former Minister of Labor, must provide a guarantee of principal. The guarantee is applied at retirement or when the employee switches plans. Applying the guarantee this way places a lower burden on employers than if the guarantee had to be met every year.

In addition to the Riester plans, starting in 2005 some plans have offered guaranteed funds, where the guarantee is of a minimum benefit as of a target date. If the funds are withdrawn before the target date, the guarantee does not apply (Cheek and Mecklenburg 2009).

Japan. Since 2001, defined contribution plans in Japan that are based loosely on the 401(k) model provide a guarantee of principal, as in Germany. Participants may select from among three or more investment alternatives which must contain at least one capital guaranteed product (guarantee of principal). A registered company (third party administrator) provides the range of investment products, information to improve financial literacy, and administration of participant investments.

The Slovak Republic has also introduced a guarantee of principal (see Appendix).

Guarantees Below the Risk Free Rate of Return

Belgium. Starting in 2004, a minimum rate of return guarantee is required for voluntary defined contribution pensions in Belgium. The minimum guarantee rate is 3.75 percent for contributions by employees and 3.25 percent for contributions by employers. These rates are considered to be set for an indefinite period, presumably lasting many years. The actual market rate of return must be paid if it is higher than the minimum (Antolin et al. 2009). A result of this requirement is that plan sponsors have invested highly conservatively.

Denmark. Denmark has a large flat rate social security benefit complemented by a mandatory employer-provided defined contribution plan, called the ATP plan. Both employers and employees are required to contribute, with the contribution based on hours worked rather than earnings. Its importance is limited, however, because the contributions and benefits are small. The ATP provides a guaranteed rate of return that for years has been set at 4.5 percent. It was reduced to 3.5 percent between 1994 and 1999, and since 1995 it has been 1.5 percent on new insurance policies. In 2002, the guaranteed rate on old policies was reduced from 4.5 percent to 2.0 percent. It was reduced because lower market interest rates made it difficult to guarantee the higher rate. The level of the guarantee is restricted by the European Union 3 Directive on Life Assurance. That directive limits a rate of return guarantee to no more than 60 percent of the rate of return gross of taxes on government bonds.

Nearly all Danish second pillar occupational pensions are defined contribution plans. Most provide some kind of guarantee. The guarantee is issued by the pension institution, which is either an insurance company or an industry-wide pension fund. A minority of occupational pension plans are managed by banks or company pension funds.

New Zealand. The National Provident Fund guarantees a nominal rate of return of 4 percent. The fund was established primarily for the employees of local governments, but has been closed to new members for a number of years. Originally, the guarantee was applied annually. Because of difficulty meeting the guarantee, the board changed the period over which the guarantee applies to the period from April 2000 to the point at which the person receives benefits from the fund. The longer the period used to calculate the rate of return that is guaranteed, the less costly is the guarantee because a shortfall in some years can be compensated by higher returns in other years.

Switzerland. While the other guarantees discussed are in the context of a voluntary pension system, Switzerland requires employers to provide pensions. Switzerland requires its mandatory employer-provided pension plans to pay at least a minimum rate of return. Most plans pay the minimum, saving any excess as a reserve. In January 2003, Switzerland lowered its minimum interest rate guarantee for its mandatory pension plans from 4.0 percent to 3.25 percent. The guarantee level had been 4.0 percent since 1985 when the guarantee was introduced. The guarantee rate is set by the government every two years. That reduction could reduce the level of pension benefits over a worker's career by 15 to 25 percent. Switzerland announced in 2003 that it was considering further lowering the guaranteed rate to 2.0 percent. The criteria for determining the minimum guaranteed rate are based on returns of 10-year Swiss government bonds and returns on investments. In addition, the financial situation of insurance companies is considered. Based on the returns of 10-year Swiss bonds, which in 2003 were 2.4 percent, the BSV 93 index of Pictet Bank, which measures a theoretical average performance of portfolios subject to the Swiss pension law, and the negative performance of other investments in 2002, the Federal Office for Social Security recommended a reduction to two percent. A

minority of the commission believe that, given the difficult situation of many pension funds, the rate should be reduced to 1.5 percent, while a smaller minority favored a rate of 2.7 percent based on an investment portfolio model. It ultimately decided to lower the guaranteed rate to 2.25 percent starting January 2004. Then effective 1 January 2008 it raised the rate from 2.25 percent to 2.75 percent (Antolin et al. 2009). In January 2009, the Swiss government reduced the rate from 2.75 percent to 2.0 percent after the crisis in financial markets hurt returns (Gallu 2008). According to an analysis made by Watson Wyatt for the Swiss pension fund association ASIP, the median annual return over the last 5 years was 1.9 percent, with returns ranging from 0 to 4 percent (Ottawa 2009).

Guarantees Above the Risk Free Rate

World Bank. Staff joining the World Bank, with its headquarters in Washington, DC, after April 14, 1998 participate in a three-tiered retirement plan that includes a defined benefit component, a cash balance (CB) component, and a voluntary savings component. Contributions for the CB component include 10 percent of net salary from the Bank (employer) and 5 percent from the employee. The CB is a notional account plan and offers employees eight investment index options—one of which, the Real 3%, provides a guaranteed return of 3 percent above the inflation rate as defined by the US Consumer Price Index (CPI). This index is applied for one year commencing on May 1 and ending on April 30 of the following calendar year. All CB account options are denominated in US currency. The Real 3% is the default option for the CB component if the employee fails to make an investment selection for the CB component. Preservation of the participant's initial capital would be expected since deflation would have to exceed 3 percent for the minimum return to fall below zero percent. Due to the decline in the US CPI, the latest credited annual return (May 1, 2009 to April 30, 2010) for the Real 3% index is

2.62 percent. As of June 30, 2009, annualized returns for the past five- and ten-year periods are 5.94 percent and 5.78 percent, respectively.

SUMMARY

This paper has posed four questions. First, how durable are fixed guarantees? The answer is that fixed guarantees at a relatively high rate have been adjusted in a number of cases, while low rate guarantees have been more stable. Second, what changes have occurred? A number of plans with relatively high fixed rate of return guarantees have reduced, suspended, or ended those guarantees, or ended them for new participants as a result of the three-year decline in stock market prices starting in 2000 or the market meltdown starting in 2007. The term “fixed” as used here indicates a continuum. Some, for example have a guarantee period of a year or six months.

The third question concerns how some pension plans managed to continue providing a fairly generous rate of return guarantee. The YMCA has maintained its guarantee, albeit at a reduced level, by having an unfunded liability. In this way, some plans with minimum rate of return guarantees have become like defined benefit plans. Some government plans have maintained their guarantees through government subsidies. Most of the plans we have identified with guarantees above the risk free rate are provided by state governments in the United States for their employees.

The fourth question relates to new guarantees since 2000. Those guarantees, which may have to some extent been a reaction to stock market downturns, have been for a guarantee of principal or at a low rate.

CONCLUSIONS

The experience of the market meltdowns starting in 2000 and 2007 provide insight into the functioning of rate of return guarantees. The primary finding is that a number of plans that have maintained a positive “fixed” rate of return guarantee have been forced to adjust those rates downward in the market meltdowns of the early twenty-first century. Fixed guarantees are neither fixed nor guaranteed into the future.

Some plans have reduced the guarantee. Some plans have ended the guarantee for new members. Some plans have entirely ended the guarantee. Some plans have lengthened the period over which the guarantee applies, so that it no longer applies on an annual basis.

At the same time, there has been a growth in the number of plans offering a zero rate of return guarantee. Plans with a fixed nominal rate of return guarantee of zero (guarantee of nominal principal) have been better able to maintain those guarantees. Since 2000, Germany, Japan, Belgium, and the Slovak Republic have added a requirement of a zero rate of return guarantee. To our knowledge no country or plan provides a guarantee of real principal, but Belgium provides a guarantee at a relatively low rate, as does Switzerland, with these guarantees approximating a guarantee of real principal.

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Table 1. Average Real Rates of Return Received on Pension Funds in Select Countries, 2008

Country	Real rate of return
Ireland	-37.5%
United States	-26.7%
Iceland	-22.9%
Belgium	-21.6%
Japan	-20.1%
Denmark	-16.8%
Switzerland	-12.6%
Germany	-8.5%
OECD	-23.0% (weighted average) -17.0% (unweighted average)
Source: OECD (2009)	

Table 2. Defined Contribution Plans with Minimum Fixed Rate of Return Guarantees

Plan	Guaranteed Rate in 2000	Guarantee Type	Change Since 2000	Financing of Guarantee
United States				
Florida DROP Plan	6.5%	Fixed	No change	Defined benefit plan
Indiana ASA account	8.2%	Fixed	3.5% (2009)	Defined benefit plan
Los Angeles DROP Plan	5%	Fixed	No change	Defined benefit plan
Louisiana State DROP Plan	0%	Fixed Changed to minimum (2004)	New La DROP plan (2004) crediting interest at lower money market rates	State government
Montana Stable Value Fund	0%	Minimum	Change in credited rate above floor	Insurance company
Ohio State	7.75%	Fixed	6.5% (2003)	Defined benefit plan
Oregon State	8%	Minimum	8% fixed (2003)	Reserve account, State government
Texas Counties	4%	Fixed	No change	Insurance company
United Methodist Church	6.5%	Fixed	3% (2001) 0% (2003)	Reserve fund, unfunded liability
YMCA	5%	Minimum	1% (2009)	Reserve fund, unfunded liability
International				
Denmark ATP plan	4.5%	Fixed	2% (2002) old policies Market rate (2008)	Reserve fund, insured liability
New Zealand National Provident Fund	4%	Fixed	No change	Government
Switzerland Employer-provided	4.0%	Fixed	3.25% (2003) 2.25% (2004) 2.75% (2008) 2.0% (2009)	Plan sponsor
World Bank Real 3%	3.0% above inflation	Minimum	No change	Plan sponsor
Sources: see text				

Appendix 1. Selected Countries with Fixed Rate of Return Guarantees

Argentina. When starting the new system in Argentina, the government decided that the state-owned Banco de la Nación should establish a state-owned pension fund management company (AFJP) which would provide an fixed rate-of-return guarantee specified in pesos and US dollars. In 2008, it ended its mandatory individual account system.

Kazakhstan. The state guarantees the principal for the mandatory individual account plans. This is equivalent to a rate of return guarantee of zero percent.

Malaysia. The Employees Provident Fund of Malaysia (EPF) declares its dividends annually. The EPF Act of 1991 guarantees a minimum dividend (real rate of return guarantee) of 2.5 percent per annum (Bateman and Piggott 1997). Should the EPF fail to secure sufficient income in order to declare a dividend of at least 2.5 percent, the government will finance the difference. Before a dividend exceeding the guarantee can be declared, it must be settled in advance by the EPF. Dividends are computed on the monthly minimum balance of members.

Singapore. The Central Provident Fund (CPF) in Singapore has three separate pools of investible funds. The largest is the members' balances with the CPF Board. This fund must be invested in floating-rate government bonds specifically issued to the CPF Board to meet interest and other obligations without quoted market values. The floating rate is exactly identical to the interest rate that is paid by the CPF Board to its members. Since 1986, the interest rate paid to members has equaled a simple average of the 12-month deposit and month-end savings rate of the four major local banks, subject to a minimum nominal rate of 2.5 percent, as spelled out in the CPF Act. In addition to this, funds in the Special and Retirement Accounts earn an additional 1.5 percent, for a minimum of 4.0 percent. These guarantees were adjusted in July 1999 to better reflect prevailing market conditions. Interest rates are now adjusted quarterly and

the new calculation gives an 80 percent weighting to 12-month fixed deposits and 20 percent weighting to month-end savings deposit rates .

Slovak Republic. In 2009, the Slovak Republic started requiring that the pension fund management companies guarantee a zero percent rate of return every six months. If they fail to achieve that rate of return, they are obligated to make up the difference. If they exceed that rate of return, they are allowed to charge a management fee on the investment earnings.

United States. In 2003, TIAA-CREF temporarily suspended sale of its after-tax deferred annuity product, Teachers Personal Annuity and Personal Annuity Select. With interest rates at historic lows, it indicated that it could not continue to accept new customers for products that are required to provide a minimum guaranteed rate of 3 percent nominal on their Fixed Account (TIAA-CREF 2003).

Uruguay. Uruguay permits both private and public (government) management of pension funds. For the state-owned fund management company, the government guarantees a minimum annual real rate of return equivalent to 2 percent. If the fund earns less than that rate for a year, the government transfers money to make up the difference. The private pension fund management companies must maintain a guarantee fund, which is used to supplement pension accounts of workers if the return of their portfolios falls below a defined minimum rate of return: the lower of 2 percent real and the average industry return minus 200 basis points (2 percentage points), whichever is lower. This regulation may create a competitive disadvantage for the private funds, which must bear the financial costs of maintaining the guarantee fund. This seems to have contributed, at least partially, to the dominance of the state-owned fund in the pension fund industry--an industry that ranks among the most highly concentrated in Latin America.

In setting a fixed rate of return, Uruguay differs from most other reform countries in the region (Argentina's applies only to the state-run AFJP). The return is calculated monthly on a rolling basis. Should a private pension fund underperform the benchmark, the difference must be covered first from the fluctuation reserve, then from the additional mandatory reserve fund, and finally from the management fund's own capital. The fluctuation reserve is financed through a fund's performance above the band. When the fluctuation reserve reaches 5 percent of the mandatory retirement savings or 3 percent of voluntary savings, the excess must be credited to member accounts.