

The copyright for "Pensions, Economics & Public Policy"
by R. Ippolito is held by The McGraw-Hill Companies, Inc.

Pensions, Economics and
Public Policy

RICHARD A. IPPOLITO

Director, Policy and Research
Office of Pension and Welfare Benefit Programs
U. S. Department of Labor

1986

Published for the
Pension Research Council
Wharton School
University of Pennsylvania
by

Dow Jones-Irwin

Homewood, Illinois 60430

The copyright for "Pensions, Economics & Public Policy"
by R. Ippolito is held by The McGraw-Hill Companies, Inc.

©1986

Pension Research Council
of the
Wharton School
University of Pennsylvania

All Rights Reserved

ISBN 0-87094-760-5

Library of Congress Catalog Card No. 85-73289

Printed in the United States of America

1 2 3 4 5 6 7 8 9 0 K 3 2 1 0 9 8 7 6

Public Policy Considerations

The copyright for "Pensions, Economics & Public Policy"
by R. Ippolito is held by The McGraw-Hill Companies, Inc.

Public Policy toward

Private Pensions

The discussion in previous chapters described the economic characteristics of pension plans and their economic impact, taking as given public policies that fundamentally affect the market outcomes we observe. Special attention was given to the structure of the tax system which fundamentally rationalizes savings for retirement *in the form of pensions* in the United States. But most other policies that affect the structure of pensions was given only passing attention, and no judgments were made whether prevailing public policies should exist, at least in their current forms. From a strict efficiency viewpoint (that is, ignoring equity concerns), does pension policy toward private pensions in the United States make sense?

In this chapter, some space is devoted to consideration of what public policy toward pension *should* be. Is the tax policy reasonable and desirable? Do other pension and related policies make sense? The answers to these questions depend on the objective of public policy. For our purposes, it is assumed that the goal of public policy toward pensions is to eliminate artificial obstacles to voluntary private market solutions for generating retirement income. If individuals want to save for retirement, the government should not introduce distortions that frustrate these intentions. Neither should it artificially affect individuals' work decisions, including their choice of retirement ages. In addition, the less intrusive the government is in affecting private savings avenues for retirement, the less pressure that will be exerted on public programs like the social security system. With these goals in mind, a series of tax and other pension-related policies are evaluated, leading to recommendations for change that would create a more efficient private pension system.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

TAX TREATMENT OF PRIVATE PENSIONS

Personal Income Tax Treatment of Pensions

The special treatment of pensions in the personal income tax system in the United States can be thought of as a partial transformation of the income tax to an expenditure tax. That is to say, in the current tax code, neither implicit pension savings nor accumulated interest on these savings are included as taxable income during the individual's work life. Instead, these savings plus interest are taxed when they are drawn in the form of pension benefits to support retirement consumption. These tax rules essentially mimic an expenditure tax framework because income is not taxed at the point at which it is earned, but rather at the point at which it is used to support consumption.

The appeal of an expenditure tax is that it removes the distortion in an income tax that favors current versus future consumption. If the demand for future consumption is sensitive to the interest rate, an income tax that includes interest earnings as taxable income can substantially affect the choice of consumption today versus tomorrow, and therefore can significantly reduce the overall rate of savings and the capital stock (see Chapter 9). The efficiency of an expenditure tax, however, is not unambiguously superior to that of an income tax. It is well known that to raise the same level of revenue, a proportional expenditure tax acts to reduce labor supply more than a proportional income tax because it imposes a higher tax rate on earned income.¹

The ambiguity in efficiency comparisons does not end here. If the tax structure is progressive, the lifetime labor supply allocation is also affected by the choice of an income or expenditure tax system.² Consider that in a progressive tax structure, the tax rate is positively related to the individual's rate of work (i. e., rate of income). Higher rates of work are taxed at ever higher marginal tax rates. But additional years of work are taxed at the individual's average tax rate. The individual can therefore reduce the lifetime tax burden levied on the same lifetime income by reducing hours of work and by reducing the retirement period (see Table 8-2). Thus, progressivity induces more leisure during the work life and less leisure in the form of retirement.

The special tax treatment of pensions works to offset this distortion. This tax structure allows the individual to evenly divide lifetime income over all periods of life for tax purposes. As such, all additions to lifetime income, whether generated through higher rates of work or

¹See, for example, David Bradford, "The Case for a Personal Consumption Tax," in *What Should Be Taxed: Income or Expenditure?* ed. Joseph A. Pechman (Washington, D. C.: Brookings Institution, 1980), pp. 75-113.

²See Richard A. Ippolito, "Income Tax Policy and Lifetime Labor Supply," *Journal of Public Economics* 26 (April 1985), pp. 327-47; also see Chapter 8.

The copyright for "Pensions, Economics & Public Policy"

by R. Ippolito is held by The McGraw-Hill Companies, Inc.

shorter retirement, are treated in the same way; hence, there is no incentive to rearrange optimal lifetime labor allocation. However, while the pension tax deferral eliminates this distortion, it can create another by affecting the rate of consumption over life. That is, in this system, consumption itself is subject to a progressive income tax which in turn induces individuals to smooth consumption over life even if they prefer, say, to consume less during retirement compared to work years.

If hours are fixed, it is not even clear how the pension tax deferral affects the incentive to work. In particular, under an income tax, individuals' decisions to work one more period depends on the average tax imposed on one period of income. Under an expenditure tax, individuals act as if they can evenly divide their additional income across all periods in their lives. That is, higher lifetime income implies a higher consumption rate across life, and hence, an increase in tax liability during every period of life. As such, one more period's income is effectively taxed at their marginal tax rates evaluated at their consumption rates. Under an income tax, and with fixed hours, one more period's income is taxed at their average tax rates evaluated at their income rate. It is unclear which direction this price effect works; it depends in large part on the nature of the tax schedule.³

Owing to fundamental ambiguities about the net effect of these distortions and others considered in the literature, it is unclear whether an income tax is in fact more or less efficient than an expenditure tax. Despite occasional criticism of the pension "tax loophole" from an equity viewpoint, however, there is nothing in the current treatment of pensions that obviously results in a misallocation of resources. The current tax rules may indeed be substantially more efficient than a straightforward income tax. Therefore, from the standpoint of public policy, there is no scientific basis on which to form a recommendation that the current special tax treatment of pensions should be eliminated. Unless empirical evidence is developed that reestablishes the income tax as a more efficient means of taxation, the deferral of pension savings for tax purposes should be maintained.

Tax Treatment of Private Pensions versus Individual Retirement Accounts

While a case can be made in favor of special tax treatment of pensions, it is unfortunate that this tax treatment was (and to some extent still is) tied to firm-operated private pensions. Prior to 1974, savings for

³It turns out empirically that individuals who are covered by pensions and who are therefore substantially affected by an expenditure tax system, tend to retire earlier than individuals who are not covered by pensions. The relationship is critically dependent on the individual's wage. See Ippolito, "Income Tax Policy."

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

retirement were eligible for tax-preferable treatment only if they were made through a private (or public) pension plan. ERISA made Individual Retirement Accounts (IRAs) available to individuals who were not covered by private pensions; beginning in 1982, IRAs were made available to individuals who were already covered by a private pension. All IRAs, however, are subject to nominal contribution limits that may be constraining either currently or in the future as inflation takes its toll on the limits now set.

By historically tying the availability of the special tax treatment to firm pensions, imperfections that have distorted individual choice have been introduced into the tax system. Partly for administrative cost reasons and partly because of Internal Revenue Service rules (discussed below), firm pension rules are applied across broad segments of the firm's labor force. Ruling out perfect matching between individuals and firms, individuals under the current code will typically settle for implicit savings rates that differ from their optimal rates. Moreover, because of the special tax status afforded pensions, firms have strong incentives to use this vehicle in place of alternative (perhaps more efficient) deferred wage incentive schemes.

The imperfections in the current tax code that discriminate in favor of firm-sponsored pensions can be easily remedied. As a first step, contribution restrictions on IRAs should be eliminated, putting them on par from a tax perspective with private pension systems.⁴ Private pensions would then be required to compete with a system that would offer individuals complete flexibility in rearranging their income flow over life, for tax purposes.

While this alternative would provide a suitable vehicle to match the tax-saving aspects of private pensions, a further change in policy is required to match the annuity features of private pensions. That is to say, private pensions that have annuity-only payouts (no lump-sum options) may indeed provide a pooling function, forcing groups of individuals to commit to pension annuities early in life with penalties for early departure (see Chapter 6).

Individuals can replicate this function in part by opening an IRA account with an insurance firm that offers annuity-only payouts. These accounts usually impose substantial front-end "loads" that effectively penalize participants who attempt to leave early and reduce the rate of return to late joiners. Specific age limitations for joining can also be imposed. This system is not ideal, however, because individuals effectively must commit themselves to a particular insurer's annuity for 20–30 years, regardless of its performance. If individuals try to break their

⁴Actually, IRS rules limit contributions to private pension plans to be consistent with annuities that are roughly \$90,000 per year. This limit is indexed to inflation beginning in 1987. Alternatively, IRS rules permit contributions up to \$30,000 per year in defined contribution plans. IRAs could be subject to similar limits.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

commitment, a selectivity problem is signaled. In addition, they must forgo the potential transactions cost savings associated with group policies.

If, on the other hand, the employer pools all willing participants in the firm and negotiates a single contract with an insurer on the participants' behalf, a contract can be written that ties individuals to a long-term commitment that still ensures mobility for the pool as a whole. That is, the insurer can still impose constraints on the age of entry into the plan and impose penalties for early withdrawal. But since no selectivity problem is signaled when the entire pool is moved, the employer can presumably change insurers on behalf of the pool participants, depending on price and performance, without paying a penalty that is related to selectivity problems.⁵

The Department of Labor has recently issued a ruling that allows firms to act as collection and pooling agents of sorts for workers' IRA contributions.⁶ In light of these rules, elimination of the IRA contribution limitations would allow tax and annuity motivations to be satisfied without private pensions. There would be no motivation for firms to offer non-IRA pension plans as they now do unless: (1) significant production efficiencies result from deferred wages; (2) significant selection problems still remain if individuals can choose whether or not to join an annuity (even if they must commit themselves at an early age); or (3) significant group rate savings are forgone if a firm's entire work force does not participate in an annuity program.

The introduction of salary reduction 401(k) plans in 1981 represents a step toward attaining the solution. Firms can now offer workers the opportunity to contribute variable amounts to a plan (usually defined contribution) without requiring (though permitting) matching firm contributions. Combined employer and employee contributions up to 25 percent of salary are tax deductible (subject to a \$30,000 limit). Though the plans are again tied to the firm and are still subject to IRS discrimination laws, 401(k)s represent a significant step toward establishing a more efficient voluntary private pension system.

Potential for tax arbitrage. It can be legitimately argued that incorporating a policy of unconstrained IRAs into the tax code could lead to an arbitrage system of sorts, resulting in a systematic raid on the

⁵As long as a pool has been previously subject to an insurance annuity scheme that discourages early departure and late joining, a new insurer with similar rules has no reason to charge a premium that accounts for a selectivity bias. Hence, there should be no penalty for switching firms.

⁶See Department of Labor Advisory Opinion reproduced in the Bureau of National Affairs, No. 373, December 21, 1981, pp. 12-13. Individuals can elect to make their IRA contributions in the form of payroll deductions. Firms are allowed to select one or more investment options for employees' IRA contributions, including insurance annuity accounts. The moneys are collected by the firm and sent to the chosen financial institutions. There are no artificial barriers preventing the firm and financial institutions (including insurance firms) to impose penalties for leaving early or to set limits on the latest age at which participation can begin.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

United States Treasury. The potential for arbitrage arises because IRA accounts can accumulate interest tax free; yet individuals can deduct interest on their personal income tax returns on moneys borrowed in the market. Arguably, individuals could borrow moneys to inflate the size of their IRAs beyond their optimal levels thereby collecting tax-free interest in their IRA accounts while paying tax-deductible interest on the loans. A similar game could be played through a private pension by inflating the pension portion of total compensation. But presumably its operation would be subdued by the heterogeneity of the work force. In particular, workers in lower tax brackets would presumably be unwilling to tolerate unusually low cash wages unless a significant premium were offered; yet the IRS requires that similar pension rules apply to all workers in the firm (see below).

The arbitrage model has been applied to corporate pension plans.⁷ The problem can be significant at this level because the corporate tax rate is a flat rate for large firms; hence, wide limits are available to the firm within which it can effectively drain funds from the Treasury. But individuals face a progressive tax, and they must treat "excess" contributions and ultimately "excess" benefits like other IRA contributions and benefits for tax purposes. It is shown in Appendix 12-1 that as individuals attempt to continue deducting higher "excess" contributions to their IRAs during their work lives, and claiming correspondingly higher "excess" taxable income during retirement, they pay ever higher tax penalties for the privilege of trying to outsmart the Treasury.⁸

In a sense, the arbitrage game in the personal income tax unravels the tax gains attributable to smoothing income through the "honest" use of IRAs. Since the arbitrage possibility becomes self-defeating at the personal income tax level; it is not expected to pose a serious problem for public policy.

Payroll tax treatment. It could be argued that unconstrained IRAs are still noncompetitive with pensions because of the payroll tax. Since IRA contributions must first appear as earnings before they are invested, they are subject to a payroll tax while private pension contributions are not. But the payroll tax assessment is not a tax as such because future benefits are tied to the earnings base of the tax. The dominant payroll tax assessment on cash wages is the approximate 14 percent

⁷See Irwin Tepper, "Taxation and Corporate Pension Policy," *Journal of Finance* 36 (March 1981), pp. 1-14.

⁸Consider the model discussed above where it is optimal to save through use of an IRA until marginal tax rates during work and retirement years are equated ($t_w = t_r$). As the individual borrows the amount B to fund excess contributions (and ultimately benefits), he gains the amount $t_r B i / (1 + i)$, where i is the interest rate. But he pays a price for this privilege by reducing t_w and raising t_r ; that is, he deducts the borrowings at a lower tax rate and declares borrowings plus interest at a higher tax rate. The more the individual borrows, the worse the tax penalty becomes. For more detail see Appendix 12-1.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc. social security tax (50 percent technically paid by the employer). Thus, a 14 percent social security assessment will be levied against pension savings that are destined for IRA accounts. But since social security benefits are computed on the basis of lifetime earnings subject to the tax, social security benefits will also be higher as a result of higher cash wages. In some sense, part of intended pension savings are diverted to future social security benefits and part to IRAs.

Given the current social security benefit formulas, this "tax" may actually turn out to be a net subsidy, giving IRAs a net advantage over pensions, not vice versa.⁹ In addition, it will be apparent from the ensuing discussion that individuals may actually be able to reduce their lifetime income tax liability by choosing to increase their level of participation in the social security system and reducing their level of participation in private pensions, suggesting another bias in the payroll tax assessment in favor of IRAs, not private pensions.

Admittedly, it would be administratively consistent to exempt IRA contributions from the payroll tax. It would also avail IRAs the same opportunity as pensions to substitute for social security benefits on the margin. But, while equal treatment of IRAs and pensions under the payroll tax eliminates any advantages to one vehicle or another that may exist under current law, these advantages are small. Hence, this change in tax law is not a first order priority toward ensuring neutrality between pensions and IRAs.

Corporate tax treatment. If constraints on IRAs are eliminated, the question arises whether tax rules permitting deductions and tax-free accumulations for pension contributions at the corporate level should be retained. While a worker's lifetime compensation presumably will be related to his value of marginal product over his lifetime in the firm, the firm may find it efficient either to pay the individual his marginal product each period or to defer part of his implicit compensation until later in the individual's career in the firm.

Without the availability of unconstrained IRAs, the firm's decision to arrange the payout of compensation over various tenure levels is distorted in two ways. First, since private pensions offer a unique vehicle for the individual to accumulate savings at a tax-free rate, the firm is induced to offer deferred wages even though it may be efficient to pay wages immediately. Second, if it is efficient for the firm to pay deferred wages, the firm is induced to use pensions compared to the alternative of, say, paying wages that increase over the worker's tenure, because the nonpension schemes do not provide tax-free accumulations.

⁹See, for example, Roger Gordon and Alan Blinder, "Market Wages, Reservation Wages, and Retirement Decisions," *Journal of Public Economics* 14 (October 1980), pp. 431-42; Richard Burkhauser and Jennifer Warlick, "Disentangling the Annuity from the Redistribution Aspects of Social Security in the United States," *Review of Income and Wealth* 27 (December 1981), pp. 401-21.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

With unrestricted IRAs available, the tax code for private pensions can be modified in either of two ways, each of which carries its own distortion. If the corporate tax preference for private pensions is eliminated, the firm is free to choose its optimal method of deferred wages, without facing a tax bias toward pensions. In this case, however, the tax code favors immediate wages compared to deferred wages because the individual can accumulate savings at a tax-free interest rate, even if the firm cannot, and therefore workers will clearly prefer IRAs to either private pensions or other deferred wage schemes. Hence, the firm must pay penalties to its workers if wages are deferred through the firm.

If the corporate tax preference toward private pensions is retained, the firm and the individual can each accumulate tax free, and hence the distortion between immediate and deferred wages is eliminated. But if the firm chooses to provide deferred wages, it is biased by the tax code toward using a private pension vehicle instead of some other scheme.

Since one choice is not obviously more efficient than the other, it seems preferable to retain the current tax policy toward pensions. The distortion between immediate and deferred compensation is therefore eliminated. To the extent that deferred wages are efficient and important, private pensions will be retained because there is a tax preference that favors pensions over other vehicles to defer wages. In this case, IRAs will be used primarily by individuals who wish to save at a higher rate than the savings rate implicitly offered through the firm. The tax system itself, however, will not determine which form of retirement pensions will prevail, IRAs or private pensions.

Personal Income Tax Treatment of Social Security Contributions

If current tax treatment of private pensions is good public policy from the perspective of economic efficiency, it is reasonable to wonder why the same tax policy is not applied to the main competing system for producing retirement income: social security. The U. S. tax code influences the individual's implicit choice for pensions compared to social security. The social security system is a mandatory program for almost all workers, but presumably its size is determined by aggregate implicit demand, manifested by legislation. While this demand is affected by numerous factors, the current size of the system could be too large, owing to the peculiar way in which social security contributions and benefits are treated in the U. S. tax system.

Presumably, public and private pensions are alternative vehicles to attain the same goal: to provide a means to save for retirement consumption. But the tax code does not treat social security and private pension contributions and benefits in the same way. It was shown above

The copyright for "Pensions, Economics & Public Policy"

by R. Ippolito is held by The McGraw-Hill Companies, Inc.

that the tax treatment afforded private pensions can be rationalized on the basis of efficiency because it imposes neutrality between immediate and postponed consumption. Peculiarly, the same tax treatment has not been extended to the social security system. As a result, the tax code induces individuals to prefer a combination of public and private pension schemes even though one alone might be superior otherwise. The distortion is easy to demonstrate.

Let individuals pay \$1 in contributions per year to the social security system (\$.50 is contributed directly by the individuals and \$.50 is contributed by the firm on the individuals' behalf). Individuals pay the marginal tax rate during work years, say t_N times their "own" \$.50 contribution. The immediate taxation of this contribution is not itself attractive compared to a \$1 contribution to a private pension because in the latter case the tax on the entire \$1 contribution is deferred until retirement. The advantage of the social security system is that the other \$.50 which is technically contributed by their employer (but which we assume is effectively paid by the employees)¹⁰ has (until recently) avoided income taxation. The individuals' effective tax rate on their social security savings is therefore $.5t_N$. (Consideration of recent tax law changes toward social security are discussed below.)

The tax savings for a dollar saved through a private pension is $t_N - t_L$ where t_L is the marginal tax rate during retirement. It is always advantageous for individuals to save their "first" dollar for retirement through a private pension because the first dollar of retirement income is effectively untaxed (i. e., t_L is zero until income exceeds the standard deduction). But as the rate of contributions to a private pension increases, the marginal tax gain per dollar falls because t_N falls and t_L increases. When $t_N - t_L$ falls below $.5t_N$, savings through the social security system becomes more advantageous than savings through a private pension.

In the particular (zero-interest) model discussed above, it is optimal for these individuals to save through a private pension until tax rates are equalized ($t_N = t_L$). Hence, at some point, the substitution of social security for pensions will be advantageous because at no-social security equilibrium, the difference between marginal tax rates is zero ($t_N - t_L = 0$) which is less than $.5t_N$. This is a general result that is not dependent on the zero-interest assumption.

If participation in the social security system were voluntary, it is easy to demonstrate that either the revenue losses to the Treasury would be astounding or the intertemporal consumption distortions would be

¹⁰See, for example, Richard Burkhauser, "The Early Acceptance of Social Security: An Asset Maximizing Approach," *Industrial and Labor Relations Review* 33 (July 1980), pp. 484-92; also, Larry Kotlikoff, "Testing the Theory of Social Security and Lifetime Accumulation," *American Economic Review* 69 (June 1979), pp. 396-410.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

sizable, depending on whether individuals could borrow against retirement income.¹¹ For present purposes, it will suffice to show that even the current limited social security system can lead to nontrivial tax savings for the average taxpayer in the United States.

To determine the incremental tax savings attributable to the special tax treatment of social security, the lifetime utility model described in Chapter 2 was optimized in the same way that it had been to show the tax advantages of private pensions. For these purposes, a social security system of a size that reflects the current level of benefits in the United States was imposed. However, to isolate the associated tax advantages, the system was constrained to be actuarially fair to all participants (no income transfers were allowed).¹² The optimal (lower) private pension savings rate was determined, and the total income tax bill yielded by the new model was recalculated. This tax burden is compared to the tax burden imposed at various income levels in a "pension but no social security" world. The revised lifetime tax liabilities and the absolute tax savings conferred by an actuarially fair social security system are presented in Table 12-1.

It is apparent that the social security system combined with a personal tax deferral scheme confers additional tax savings on those savings already generated by the use of private pensions alone. The results show that individuals at the \$10,000 income level gain \$4,200 in incremental tax savings from the tax preference afforded to social security contributions. Individuals at the \$30,000 income level obtain a \$13,000 tax rebate, and individuals in the \$50,000 income range reclaim \$18,600. By voting for a limited social security system to augment private pensions, tax-paying workers individually vote for the equivalent of a 5

¹¹If individuals can borrow against retirement income, it is easy to show under plausible conditions that if they could choose their level of social security participation, they would contribute all of their nonpension income to the social security system, effectively reducing their marginal tax rate by 50 percent over the relevant range of income. They could then borrow against their now "too high" retirement income to smooth consumption over their lifetime. If individuals cannot borrow, the effect of contributing to the social security system is to reduce consumption during work years and to raise consumption during retirement years. Thus, the marginal utility from consumption during retirement falls and the marginal utility from consumption during work years increases. As individuals continue contributing toward social security, the tax savings on each \$1 contribution fall because the tax rate forgone on inframarginal contributions continues to fall. But the consumption inefficiencies generated by each additional dollar contributed continue to increase. These forces impose a natural limit on the amount of income that is transferred to retirement, despite the income-tax advantages.

¹²For the purposes of this calculation, it was assumed that the worker retiree ratio is constant and that productivity growth is zero. The average benefits by income level that prevailed in 1982 in the social security system were determined. Accounting for the distribution of retirees across income levels, a tax rate was determined that precisely generated 1982 aggregate benefits. The tax rate was not levied above the maximum taxable income under social security law, nor were benefits paid beyond the maximum amount stipulated by the social security rules in 1982.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

TABLE 12-1 Tax Advantages from Social Security

(1)	(2)	(3)	(4)
<i>Annual Income</i>	<i>Lifetime Tax with Pension (\$000)</i>	<i>Lifetime Tax with Pension and Social Security (\$000)</i>	<i>Incremental Tax Savings Conferred by Social Security (\$000)</i>
\$ 5,000	\$ 0	\$ 0	\$ 0
10,000	17.2	13.0	4.2
20,000	89.5	81.2	8.3
30,000	184.9	171.9	13.0
40,000	303.3	287.4	15.9
50,000	444.4	425.8	18.6
60,000	608.6	587.1	21.5

Numbers in column 2 are taken directly from column 4 in Table 2-1. Tax calculations listed in column 3 are derived using the model presented in Appendix 2-1.

percent reduction in their lifetime tax burden compared to a world in which all retirement income is subject to current tax treatment of private pensions. With voluntary social security participation, these tax savings would increase severalfold, especially for high-income groups.

This subtle aspect of the U.S. Tax Code may play a significant role in the comparative sizes of the social security system and the private pension system. Even if individuals clearly preferred either private pensions or social security, they would still rationally choose a combination of the schemes to minimize their lifetime tax burden. This distortion can easily be eliminated by ensuring that the tax treatment of social security contributions is identical to the tax treatment afforded private pension contributions.

The solution in this case is not to alter the tax treatment of private pensions to conform to the tax treatment of social security. If the social security tax treatment was applied to private pensions, 50 percent of pension contributions and all interest earnings would be exempt from taxation. It is easy to show that this tax policy will not only correct the bias toward immediate consumption that is inherent in a comprehensive income tax, but would actually introduce a contrary bias in favor of future consumption. By instead applying the private pension tax treatment to social security contributions and benefits, neutrality between immediate and future consumption is preserved.

In particular, all social security contributions (including employee contributions) should be deductible for tax purposes at the time they are contributed, and all social security benefits should be taxed as ordinary income at the time they are received. In this way, tax policy toward all retirement income conforms to the properties of a progressive expenditure tax (intertemporal consumption neutrality is preserved).

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

Further, the distortion of the choice between private pensions and social security caused by imposing different tax treatments on retirement income depending on the savings vehicle chosen is eliminated.

In 1984, an equivalent of this solution was introduced into the tax code but only for cases in which the income of a married worker exceeds \$32,000. That is, while half the contributions to social security are still deductible, one half of the benefits are now subject to tax (for high-income families). This solution should be modified to incorporate the solution to *all* retirees. The personal and standard deductions and the progressive nature of the tax schedule already insulate low-income retirees from the assessment of any tax on their social security benefits.

CONSTRAINTS ON PRIVATE PENSION RULES

Public policies affecting pension equilibrium are not limited to those surrounding the U.S. Tax Code. The federal government has had a long-standing influence on the structure of pension plans through Internal Revenue Service discrimination rules and, more recently, ERISA. Moreover, public policy has indirectly influenced the way in which pensions can be structured to influence retirement ages or incentives for workers to quit the firm prior to retirement age. Public policies that influence the way in which pension plan rules are structured are considered in this section.

IRS Discrimination Rules

Current Internal Revenue Service rules make it difficult for firms to tailor pensions to fit the heterogeneity of the work force. Since the Revenue Act of 1942, the IRS has imposed discrimination rules on firm pensions. In essence, firms cannot offer different pension plans to different types of employees, especially if the groups differ systematically by wage level. Firms must offer roughly comparable pensions to virtually all employees in the firm.

Whether one believes in a tax, annuity, or productivity theory of pensions, these rules have virtually ensured that inefficient wage contracts will be negotiated compared to pension schemes unfettered by discrimination rules. To the extent that the firm is merely facilitating tax deferrals or annuity savings for its workers, it is required by law to impose savings rates that are virtually identical across the firm. To the extent that the firm finds it optimal to penalize early-outs for some types of employees (e.g., supervisors or other highly compensated employees) but not necessarily others (perhaps low-paid workers), it is forced to apply some compromised strategy to all workers.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

To keep private pensions comparable with IRAs and to allow firms to more carefully tailor penalties to particular groups of employees, all IRS discrimination laws should be repealed. Firms should be permitted to: (1) offer employees the option to contribute to the pension plan at variable rates (these voluntary contributions should be given the same tax treatment as IRAs and private pension contributions); and (2) offer stylized pension plans to different groups of workers without regard to wage levels. These tax policy changes should be accompanied by regulatory changes discussed below.

Again, the introduction of 401(k) plans, discussed above, represents a positive step in the direction of introducing more flexibility into the private pension system. 401(k) plans enable the firm to offer more flexibility on the upside to workers who wish to save more than the main pension plan in effect permits. By adjusting the primary pension plan downward over time, the combination of the primary plan with the 401(k) can generate the efficiency gains discussed here. But the overall result of these plans is still subject to IRS discrimination rules which in effect rule out this option if the end result is skewed in favor of high-wage earners saving "too much" relative to low-wage earners.

ERISA Pension Rules

In many ways, ERISA can be viewed in a dichotomous way. On the one hand, the law acts to insure pension promises against mismanagement, fraud, and bankruptcy.¹³ The law provides explicit insurance through the Pension Benefit Guaranty Corporation (for which premiums are collected); the corporation partially insures promised benefits to participants of terminated defined benefit plans.¹⁴ The insurance is accompanied by a monitoring of fiduciary aspects of plans presumably to reduce the moral hazard potential created by the insurance.

On the other hand, ERISA acts to constrain the fundamental rules of a pension. In particular, the law requires that: (1) all employees age 25 and over be covered by the pension plan; (2) all employees vest within 10 years; and (3) all vested benefits be nonforfeitable. The first rule goes toward encouraging the firm to treat all employees alike, even if young employees do not find it optimal to contribute to pension

¹³The law also includes certain reporting and disclosure provisions that are not included in the discussion in the text. The Retirement Equity Act further liberalized participation age and related rules in 1984.

¹⁴As currently structured, the portion of real benefits guaranteed is a function of the inflation rate. Since the insurance guarantees nominal liabilities at the time of plan termination, these benefits erode in real terms by the time the pension benefits are paid out. The insurance is therefore far from complete. See Chapter 10.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc. plans.³⁵ The last two rules go toward constraining the penalties that firms can impose on individuals who leave the firm early.

Vesting rules preclude complete forfeiture of employees' benefits when they leave the firm prematurely except when departure occurs prior to 10 years of tenure. Nonforfeiture rules ensure that workers receive at least the nominal benefits they have accrued prior to their departure. They therefore lose a portion of their "real" benefits, but additional penalties are precluded. These rules presumably work to ensure that private pensions operate more like savings accounts than as devices to affect worker performance.

In the absence of IRAs, the government conditions tax deferral benefits on participation in private pensions. A case might be made that it behooves the government to protect individuals who might be induced by this policy to accept risks they otherwise would not accept if the same tax advantage were available outside the firm. If IRAs are available to everyone, however, these arguments are difficult to justify. Since individuals can obtain the same tax advantages afforded pensions by investing in IRAs, it can be reasonably presumed that they will participate in a private pension only if the efficiency effects generated by pensions outweigh the associated pension penalties.

In sum, given the availability of unconstrained IRAs, the rules cited above that are imposed on private pension contracts by regulation should be repealed. There should be no constraints on the firm's choice of participation, vesting, or penalty provisions. Firms should have the freedom to arrange their pension plans in any way they wish, subject only to adequate disclosure to employees. Such disclosure is now required by ERISA.

Policy Influences on the Retirement Age

The interference of the federal government with sundry pension rules described above constrain firms' abilities to use the pension to set an appropriate schedule of costs for workers who do not leave the firm "on time" (see Chapter 8). Beyond this, there have been many policy initiatives working in the direction of *directly* affecting the shape of the "cost schedule" (see Figure 8-1). For example, congressional and other proposals have been aimed at reducing the high cost of "late" retirement found earlier: they wish to do this by forcing firms to continue counting service in the pension formula past the normal retirement age or by requiring actuarially fair adjustments no matter how

³⁵It is easy to show that when individuals have a high probability of leaving, as they no doubt do at young ages, it is optimal to save less in the form of a risky pension, even though the "lucky ones" who stay reap the cumulative contributions of those who leave. The result follows directly from diminishing returns to consumption.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

late the worker chooses to retire.¹⁶ The initiatives follow legislation banning mandatory retirement ages prior to age 70 and "discrimination" in wages for older workers, leaving firms with little flexibility to influence the retirement of workers who, on average, lose their productive capability as they age.

While the federal government has been intruding into firms' abilities to arrange their production process efficiently, the government itself has been imposing heavy penalties on workers who want to work past age 65 (and firms that want to keep workers). It has done this by imposing a so-called earnings test on social security benefits on individuals who work past age 65 and distorting benefits for workers who retire prior to age 62.

The earnings test is a well-known distortion imposed by the social security system. Individuals cannot collect social security benefits unless they retire from full-time work. If these individuals choose to retire after age 65, they face a significant actuarial penalty. Workers who retire before age 62 have suffered the same kinds of "quit" losses found in private pensions (see Chapter 8). These implicit taxes on work at older ages have often been cited as distortions on individuals' preferred allocation of leisure over their lives; in essence, many individuals are induced to retire either "too soon" or "too late" compared to their preferred retirement date. In effect, the government has used the social security system to create a window of "costless" retirement between the ages 62 and 65. Retirement outside these ages, especially after age 65, has triggered substantial penalties on retirees.¹⁷ Many studies have shown a strong impact of these policies on retirement behavior.¹⁸ But production inefficiencies may also accompany the tax.

The implicit social security tax on work at older ages may inhibit firms from inducing retirement outside the 62-65 social security retirement age "window." Maximum labor productivity in some firms may depend on substantial investment ("training") periods during the work life and an accompanying lengthy work life to reap the full benefits of the investments. Effective social security taxation at older ages distorts these types of labor contracts. If firms find it efficient to keep workers at older ages, they must in effect reimburse them for incurring the effective tax imposed by the social security system. It is expensive to write private pension rules inconsistent with the age 65 (or earlier) bias imposed by the social security system. Repeal of the earnings test

¹⁶For example, in 1984, the Equal Employment Opportunity Commission proposed a regulation (46 Federal Register 43848) to require all pension plans to continue service accruals beyond the normal retirement age.

¹⁷See, for example, Richard Burkhauser, "The Early Acceptance of Social Security"; also, Larry Kotlikoff, "Testing the Theory of Social Security."

¹⁸See, for example, Burkhauser, "The Early Acceptance of Social Security."

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

would eliminate the penalties imposed on writing more diverse private pension rules and wage contracts, and therefore would lead to potentially large gains in efficiency.

In fact, Congress has scheduled the effective elimination of the social security earnings test beginning in 2010. It has also indexed wages in the formula to a labor market wage index, thereby removing most of the tax on workers wishing to retire prior to age 62.¹⁹ These represent positive steps toward removing artificial obstacles from the path of voluntary decisions to retire which should be made in the private sector, without influence from the social security system. Removal of the test makes it more likely that retirement will occur when workers and firms decide it is most efficient to do so. The direction of these policies should now be applied to the private sector, effectively removing the federal government from the business of influencing retirement patterns in the labor force.

FEDERAL PENSION INSURANCE

Depending on the theory of ERISA insurance, it is either easy or difficult to recommend the abolishment of the Pension Benefit Guaranty Corporation. If, on the one hand, ERISA was created for the benefit of comparatively poorly funded, unprofitable firms at the expense of well-funded, profitable firms, it is easy from an efficiency viewpoint, to recommend its elimination. The research results reported in Chapters 10 and 11, for example, support this view of ERISA. If, on the other hand, pensions are considered the equivalent of guaranteed future wage contracts, it is easy to recommend the replacement of ERISA insurance with a change in bankruptcy laws that makes pension promises the equivalent of wages.²⁰ There may, however, be legitimate reasons for ERISA insurance to exist and, if so, elimination of the insurance may lead to a reduction in efficiency. Some of these theories will be briefly discussed in this section.

Consider, for example, a theory of pensions that stems from the unfunded aspect of defined benefit plans. It was shown in Chapter 4 that funding levels are quite stable over time. This finding suggests that workers' exposure in the pension fund to firm bankruptcy has been relatively constant through time. It was shown in Table 4-5, however, that due to reductions in the market value of real pension assets, funding levels and therefore workers' exposure in their pension funds, experienced an unprecedented reduction between 1972 and 1974. The funding ratio in defined benefit plans fell by a factor of one third over this

¹⁹See "Social Security Amendments of 1983: Legislative History and Summary of Provisions," *Social Security Bulletin*, July 1983.

²⁰See, for example, Irwin Tepper, "Taxation and Corporate Pension Policy."

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

period. If exposure levels prior to 1972 were optimal, the sudden increase of exposure levels beginning in 1972 could have stimulated firms and workers to demand a reduction in exposure through partial insurance to restore equilibrium to the labor market.

These liabilities may not have been insurable in the private market. Private insurers can and do provide insurance against the incompetency or dishonesty of pension fund managers. But the overall market value of pension assets is highly correlated across plans; so too are firm bankruptcies. As such, it may be difficult to find credible insurance in the private market. Unless large numbers of other temporal insurable events that are independent of overall economic performance can be found, an insurer of pension assets will likely go bankrupt upon occurrence of the first catastrophe.

The federal government is in a unique position to provide insurance in these cases. In the event of an "early" catastrophe, a deficit of sorts can be run to pay losses. The government is empowered to mandate continued annual premiums to pay off the deficit on an actuarial schedule. It is at least a plausible theory that ERISA was created to provide this insurance function.

As long as this or other plausible theories exist that are consistent with positive efficiency effects from maintaining the law, and that have not been refuted through empirical tests, it is difficult to propose either elimination of or significant modifications to ERISA insurance. For example, if the law is changed so that pension benefits are fully insured either through a modification of ERISA or a change in bankruptcy laws to equate pensions with wages, the resulting elimination of worker exposure to the financial performance in the firm could lead to adverse productivity effects.

Two theories, including the temporal insurance scenario which would legitimize ERISA, are discussed in some detail in Appendix 12-1; some data and evidence are used to test the validity of these ideas. The results are not encouraging to those who prefer to think of ERISA as something other than a transfer mechanism. Nevertheless, we cannot rule out the possibility that either other data or theories could be found to lend support to a legitimate theory of ERISA insurance.

If it is efficient for the government to offer insurance, it follows that the government should protect the fund from moral hazard by constraining plans from either becoming excessively unfunded or allowing their portfolios to become too risky. The insurance function and the fiduciary rules should therefore be retained until more work is done to understand the financing role of unfunded pensions—and until more is understood about the reasons why ERISA insurance was offered in the first place (though one theory was presented in Chapter 10).

One change, however, can be made regardless of the theory of ERISA that ultimately prevails: the insurance premiums assessed by the Pen-

The copyright for "Pensions, Economics & Public Policy"

by R. Ippolito is held by The McGraw-Hill Companies, Inc.

sion Benefit Guaranty Corporation should be set in relation to the risk exposure each plan gives to the corporation, and they should be free of any subsidies from taxpayers as a whole over the long term. One easy way to accomplish this is to mandate pension plans to find insurance against legal liabilities in the private insurance market, letting these firms set competitive premium levels according to risk exposure. Fiduciary rules, including funding and investment guidelines, could then be determined competitively by the market, not arbitrarily and perhaps inefficiently by the federal government. The federal government could reinsure these liabilities at an appropriate premium to ensure that insurance firms would remain solvent even through catastrophic temporal episodes. Because of selectivity problems, the mandatory nature of the insurance could be maintained. If the corporation is maintained, it should mimic rates that would exist in the private market if ERISA insurance was "privatized".

Currently, pension plans that are 150 percent funded (in a termination sense) and are in high-growth industries pay the same premium as those that are 50 percent funded and are in contracting industries. None seems to pay true economic insurance premiums.²¹ The existence of the cross-subsidies among plans provides strong evidence that ERISA insurance is merely a mechanism to transfer moneys to a small segment of pension participants. If the insurance truly exists because of so-called market imperfections in the pension industry, the insurance should survive even though risk-related premiums are charged. If support for ERISA exists only for the purpose of transferring moneys among plans, presumably the support for ERISA insurance will evaporate in the face of an economic premium structure. In short, not only would a risk-related premium structure make ERISA more efficient but it would also provide a litmus test of sorts for the underlying support of ERISA itself.

Even if ERISA insurance is not "privatized"—if the insurance scheme remains exactly as it is—the corporation should carry an all-bond portfolio. It should do this, not because of the tax arguments made for plan sponsors (see Chapter 9); while a tax-exempt organization should hold tax-advantageous securities, arguably, the corporation should not be gaming against the U.S. Treasury. It should carry such a portfolio because the liabilities the corporation faces are uniquely *legal*. That is, as shown earlier in Chapter 3, the data suggest that pension liabilities facing firms are *real*, not *nominal*. But ERISA insurance explicitly is limited to *nominal* liabilities (see Chapter 10).

²¹Currently, firms pay insurance equal to \$2.60 per participant per year. A proposal is pending that would raise this premium to \$7.00. But it is unlikely that even this premium is economic because, among other things, it is based on the assumption that no large plans will ever terminate.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

This is a happy circumstance for the corporation because it can completely hedge its risk by immunizing these liabilities with long-term bonds. If the interest rate increases, the corporation's legal liabilities will fall, but this gain is exactly offset by a corresponding capital loss on its long-term bond portfolio. If the interest rate falls, the corporation's liabilities are increased but these are exactly offset by capital gains in its portfolio. The corporation would remove all risks associated with its inventory of liabilities. The only remaining issue facing the corporation would be the determination of the rate of future terminations, and the degree of the deficiency in these plans.

SUMMARY OF POLICY RECOMMENDATIONS

If public policy is to be designed to encourage an efficient private pension system, the following limited set of recommendations appears to be supported by theory and evidence:

1. *Retain the tax deferral treatment of pension savings.* Current tax treatment of pensions essentially mimics an expenditure-tax structure. While a progressive expenditure tax may not be unambiguously superior to a progressive income tax, there is no reason to believe that a change in the current tax code toward a comprehensive income tax will improve the allocation of resources.

2. *Retain the tax treatment of pension contributions in the corporate tax code.* This rule preserves tax neutrality between IRAs and private pensions, and therefore does not distort choice between immediate cash wages and deferred wage schemes (through pension vehicles). An unfortunate corollary of this tax provision is that wage deferral through pensions is tax-superior to wage deferrals through other schemes.

3. *Tax social security contributions and benefits in the same way that private pensions are treated.* Currently, income tax treatment of social security and private pensions induces rational individuals to prefer public and private pensions, even if only one or the other vehicle would be preferred in a zero-tax world. By taxing public and private pensions in the same way, individuals will no longer be biased by the income tax code to favor private and public systems. Assuming that the size of social security is determined by aggregate workers' "votes," tax neutrality in retirement savings vehicles will generate a more appropriate size of the social security system compared to the private pension system. Moreover, by altering the tax treatment of social security to conform to the treatment of private pensions, all savings for retirement will be made through vehicles that foster neutrality between current and future consumption. Such changes have been put into effect

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

in 1984 but are limited in their impact to a small portion of the retiree population; the rates should be equally applied to all social security recipients.

4. *Eliminate all limits on Individual Retirement Accounts.* This change, together with recent rulings by the U.S. Department of Labor, makes IRAs fully competitive with private pensions. Such a provision (together with the corporate pension tax deduction) ensures that private pensions would survive in the long run if either significant efficiency gains are generated by deferred-wage schemes or annuity rates are reduced substantially by mandatory group participation. Otherwise, pensions will be replaced by IRAs. While exemption of IRA contributions from payroll tax assessments is desirable to put IRAs on par with private pensions, this modification is not necessary to ensure approximate neutrality between the two pension vehicles. Similarly, while tax arbitrage is plausible under this scheme, tax progressivity appears to invoke substantial penalties on such activities, and therefore it is not expected to pose an important problem. The introduction of salary reduction 401(k) plans in 1981 is not a perfect substitute for the expansion of IRAs but nonetheless represents a significant step toward introducing more flexibility into the private pension system.

5. *Eliminate all constraints on private pension plan rules.* Given the availability of unconstrained IRAs, individuals have access to favorable tax treatment without joining private pensions. It can therefore be presumed that private pensions, together with their attendant rules, will persist only if they stimulate substantial productivity or other efficiency effects. Rules that stem from various Revenue Acts or ERISA constraining either the design of pension plan rules, or the creation of stylized plans for particular groups in the firm, or the participation of employees at different voluntary rates of contribution, should be eliminated. Again, 401(k) plans represent a positive step toward introducing more flexibility into the pension system but does not yield the solution described above.

6. *Eliminate the earnings test in the social security system; allow firms to erect penalties to retirement through the pension plan.* Currently, firms that wish to retain workers past age 65 must compensate workers for associated penalties imposed by social security for continued work during older ages. Thus, even though it may be efficient to extend the length of the worker's life cycle in the firm, the social security earnings test (together with actuarial penalties for work past age 65) may make these contracts unprofitable. This distortion is easily remedied by removing the effective social security tax on work at older ages. Firms will then no longer be penalized if they arrange private pensions to induce retirement at ages that are inconsistent with the social security formula. Actuarial adjustments to social security benefits to post-age 65 retirees are scheduled to be approximately actuarially

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

fair by the year 2010, which will, in effect, offset the impact of the earnings test.

The decision to remove the federal government from the business of influencing retirement ages evinced by an enlightened new policy for the social security system should be extended to private pensions. Given the existence of age-related discrimination rules and the elimination of constraining mandatory age rules, pensions are one of the few tools left for firms to schedule their workers for retirement "on time" in the sense of enhancing overall firm productivity. Proposals to interfere with retirement incentives in pension plans should not be enacted into law.

7. "Privatize" federal pension insurance. Proposals to either eliminate ERISA insurance or replace it with bankruptcy laws that make pensions superior credit claims should not be pursued until a better understanding is developed of why federal pension insurance exists and why pension plans are not fully funded. If underfunded defined benefit plans contribute to firm productivity then vigorous pursuit of either a full-funding standard or a full-insurance standard may hinder an efficiency attribute of defined benefit pension plans. Conversely, if ERISA insurance were established in response to a problem that was insoluble in the private market, elimination of federal pension insurance may lead to a similar reduction in efficiency.

The federal insurance scheme, however, should be transferred to the private sector. The federal government can mandate insurance coverage (at current levels) in the private market, providing reinsurance to rule out solvency problems in the face of catastrophic temporal events. The private market will establish economic premium structures that will include the institution of risk-related premiums. The establishment of this scheme will provide a litmus test for legitimate support of ERISA, itself. If ERISA insurance is not "privatized," the corporation should set premiums that mimic the private-sector solution and it should immunize all current liabilities by selecting an all-bond portfolio.

APPENDIX 12-1

Arbitrage Possibilities at the Personal Income Tax Level

To illustrate the limits to arbitrage at the personal income tax level, the lifetime model presented in Appendix 2-1 is used. For this purpose, the notation can be simplified by assuming that the lengths of the work and retirement periods are the same (thus, there are two periods, a work period and a retirement period). In addition, social security is assumed

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

not to exist. However, an interest rate, i , is now introduced. It is assumed that the individual faces market interest rates and that the borrowing and savings rates are identical. In particular, let the individual maximize the utility function:

$$U + U(C_N) + U(C_L) + \text{Leisure terms,}$$

subject to the lifetime budget constraint:

$$W = C_N + C_L/(1+i) + \int_0^{(1-s)W-B} t \, dl + \int_0^{(sW+B)(1+i)-B} t(1+i) \, dl,$$

where C_N and C_L are the rates of consumption during work and retirement years, W denotes wage earnings, s is the share of wages that would otherwise be saved in a pension (without borrowing), and B is the amount that the individual borrows during the work period in an attempt to outsmart the Treasury.

Note that the individual deducts borrowings B as an IRA contribution during the working period but declares B plus interest earned as taxable income during the retirement period. The distortion exists because the tax code also allows the individual to deduct interest paid on the loan in the latter period. In effect, Uncle Sam allows a deduction equal to B during the working period but requires the same amount (instead of the amount B plus interest) to be declared as taxable income in the retirement period; thus, the government provides the individual with an interest-free loan.

The optimal borrowing condition in this model is described by:

$$t_N[(1-s)W - B] = t_L[sW(1+i) + B]/(1+i),$$

where $t_N(I_N)$ and $t_L(I_L)$ are the marginal tax rates in the work and retirement period evaluated at the taxable income I_N and I_L . Thus, in the case of a flat tax rate, the above equality cannot be satisfied with a positive interest rate; hence, it is apparent that the individual will borrow until taxable income in the first period is zero.

This "money machine" solution evaporates once tax progressivity is introduced. When borrowing is zero, the optimal savings rate is determined by optimal consumption smoothing conditions. This savings rate will not be altered by the introduction of borrowing (note that, absent borrowing: $t_L > t_N$ because $i > 0$). Let the pension savings rate s satisfy this condition. Now let the individual begin borrowing. Unlike the case of a flat tax rate, the act of borrowing under a progressive system decreases t_N and increases t_L ; hence, for each dollar borrowed, a tax penalty equal to $t_L - t_N$ is imposed.

Continued borrowing results in deductions at ever lower marginal tax rates; subsequent "bogus" IRA payouts are taxed at ever higher

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

TABLE 12-2 Termination Probabilities and Average Insurance Protection, 1950-1979

Period	Termination Probability ^a		Estimated Average Insurance Protection	
	Annual (1)	25 Years (2)	F (3)	$\{(P^*/P) - F\}^b$ (4)
1950-1954	.0005	.021	.49	.33
1955-1959	.0008	.019	.63	.15
1960-1964	.0010	.025	.76	.00
1965-1969	.0013	.031	.76	-.04
1970-1973	.0025	.061	.76	-.10
1974-1979	.0054	.126	.66	-.02
Mean value	.0021	.051	.685	.045

^aThe numbers reported in the first column are probabilities that a pension plan participant was in a pension plan that terminated in a given year; the numbers in the second column represent the probability that a typical participant would belong to a plan that would terminate during tenure with the firm which, on average, is 25 years for pension recipients, assuming that the annual termination probability is that reported in the first column.

^bThe value for F is taken directly from Table 4-5. The calculation of P^*/P is presented in Table 10-1 and discussed in the related text. For these purposes, the hypothetical discount rate that would have been used by the corporation if it had existed prior to 1974 is taken to be Moody's composite industrial bond rate, which is a close approximation to the corporation's actual practice after 1974.

Source: Hay Associates, *Pre-ERISA Plan Termination Benefit Losses*. Report submitted to the U.S. Department of Labor, 1979 and unpublished data from the Pension Benefit Guaranty Corporation.

marginal tax rates. This process thwarts the arbitrage game and establishes an internal solution to the above problem. Simulations are required to establish the extent to which limited arbitrage could be successful within the context of the U.S. tax system. But qualitatively, the problem is not paramount, as it could be at the corporate level.

APPENDIX 12-2

Alternative Theories of ERISA

At least two plausible explanations focusing on market failure offer themselves as potential explanations for the enactment of ERISA. First, it may be difficult for workers to assess the true financial status of their pension plans. A cheap method of assessment may be for workers to simply observe the failure rate of other plans and attribute the same probability of failure to their own plan. If so, it is easy to imagine that a demand for insurance could arise if the observed frequency of failure of pension plans increased over time. But it turns out that the data do not lend strong support to this notion.

The probability that a worker would participate in a terminated plan in a single year and over a 25-year career in a firm is given in Table 12-2. The termination probabilities immediately prior to and after

The copyright for "Pensions, Economics & Public Policy"

by R. Ippolito is held by The McGraw-Hill Companies, Inc.

1974 are widely attributable to ERISA, and hence do not provide reliable estimates of failure probabilities in the free market.²³ Prior to 1970, more reliable estimates are presumably found. The statistics reveal an upward trend in termination probabilities, but even during the period 1965–1969 when the probabilities were highest, the probability that a participant would find himself in a plan that would terminate over a 25-year career was only 3.1 percent. Moreover, even if workers in general perceived an increase in the risk surrounding their pension, it is not clear why well-funded plans could not have eliminated the perception of the risk either by separating the plan and its operation from the firm entirely (including evaluation and reporting of its funding status) or by finding insurance (albeit incomplete) through the private market according to a risk-related premium structure.²²

An alternative explanation for ERISA concerns the growth in demand for insurance against temporal variation. Because of reductions in stock market values in the early 1970s, funding ratios across pension plans fell dramatically. The average pension plan's funding ratio in 1972 was 86 percent; in 1973, it fell to 68 percent; and in 1974, to 53 percent. During the prior 15 years, the average funding rate never fell below 68 percent. While not without historical precedent, funding ratios at similar levels observed in the early 1950s occurred when real pension liabilities were less than one fifth of their levels in the early 1970s.²⁴ It is arguable that the unusual risk exposure created by poor stock market performance could have led to a demand for a federally insured floor below which effective funding protection could not fall. Like other cyclical-protection schemes, such insurance could presumably be credibly offered only by the federal government.

This theory is appealing and perhaps consistent with other kinds of federal programs related to disaster assistance, agricultural price supports, and the like. A careful examination of the way ERISA insurance works, however, shows that while the scheme would offer some protection against some types of cyclical activity, it would have offered little or no protection to the average plan against the reductions in funding ratios that occurred in the early 1970s.

To illustrate, consider that the firm's funding ratio in the pension plan is equal to the market value of the assets in the plan, A , divided by the real pension benefits that the firm has already incurred, P . Thus,

²³Most plans that terminated just prior to and after ERISA were instances in which plans terminated their defined benefit plan and subsequently created a defined contribution plan covering the same employees. In so doing, firms not committed to the defined benefit form of plan escaped some of the impact of the federal regulation.

²⁴Due to the correlated temporal variation in funding ratios and bankruptcies, a problem clearly exists for the private market to assume liabilities for terminated pension plans (see below). But if plans are well funded, they could presumably find significant if incomplete insurance through the private market at fair rates.

²⁵See Chapter 4, Table 4–5.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

the funding ratio in the plan is $F = A/P$. If the market value of assets falls sufficiently, the firm's funding ratio in its pension plans can become alarmingly low, threatening either the solvency of the plan sponsor or the level of pension benefits. This is especially problematic to workers if firm failures are correlated with falling stock market values. A cornerstone of ERISA insurance, however, is that the Pension Benefit Guaranty Corporation insures *nominal* pensions P^* , not real pension benefits, P (see Chapter 10). In effect, then, a legal funding floor equal to P^*/P is established by the corporation.

Nominal pension liabilities P^* differ from real pension liabilities P because of inflation. As shown in Chapter 10, the effect of inflation is to increase the wedge between nominal and real pension liabilities; hence, as the rate of inflation increases, the funding floor (P^*/P) tends to fall. By using a formula derived above, it can be shown that if the inflation rate is 3 percent, the funding floor P^*/P is approximately .80; if the inflation ratio is 8 percent, the funding floor P^*/P is approximately 60 percent.²⁵

This aspect of the insurance scheme is important because it is well known that market values of diversified portfolios are negatively correlated with the inflation rate: during periods of high inflation, real rates of return fall.²⁶ This relation suggests that when asset values of portfolios deteriorate during high inflation periods, thereby reducing actual funding ratios, the corporation's funding floor also falls owing to the negative relation of the funding floor with the nominal interest rate. These factors suggest that the federal insurance scheme may offer little protection against temporal variation (at least to the extent that adverse asset performance is affiliated with inflation).

To test this suspicion, the federally insured funding floor P^*/P was calculated over the period 1950–1979. The degree of protection offered by federal insurance for the average plan is P^*/P ; the actual funding ratio of the average plan is denoted by the variable F ; values of F over the 1950–1979 period have been calculated previously.²⁷ While federal insurance did not actually exist prior to 1974, we can calculate the approximate funding floor that would have prevailed had the same insurance scheme been instituted in 1950. For this purpose, it is assumed that the corporation's discount rate would have been set equal to Moody's composite industrial bond rate, which approximates the results of applying the corporation's formula during actual practice after 1974.²⁸

²⁵The derivation of P and P^* as a function of the interest rate is given in Chapter 4.

²⁶See, for example, Eugene Fama and G. Schwert, "Asset Returns and Inflation," *Journal of Financial Economics* 5 (November 1977), pp. 115–46.

²⁷See Chapter 4, Table 4–5.

²⁸Comparing pension liabilities evaluated at the market interest rate and those evaluated at real interest rates is done using algorithms given in Chapter 4.

The copyright for "Pensions, Economics & Public Policy" by R. Ippolito is held by The McGraw-Hill Companies, Inc.

The results of these calculations are shown in the last column of Table 12-5. The results show that if federal insurance had been in place in 1950, some significant protection would have been offered by the insurance scheme during the 1950s. But from 1960 onward, the scheme would have offered virtually no insurance to the average plan. The best test of the theory is provided by the experience after 1970 because, in this view of ERISA, the adverse funding experience in the early 1970s is presumably the stimulus for insurance. During the period 1974-1979, funding ratios fell to 66 percent on average, but the hypothetical pension insurance floor fell just as dramatically. Indeed, the insured funding floor was two percentage points lower than the funding ratio for the average plan during the period. The insurance failed to materialize because poor market performance was accompanied by high inflation which, by design, reduces the protection offered by the corporation.

Had the insurance scheme actually been created in 1950, it could be argued that the lack of protection afforded pensions during the early 1970s was not foreseen. But if the insurance arose in response to the dramatic reductions in funding that occurred during the early 1970s, it is farfetched to think that the insurance would not have been designed to accommodate such temporal episodes. The evidence, taken together, offers little support to the notion that the federal insurance program is designed to insure plans against cyclical fluctuations in funding ratios. While other legitimate explanations of the insurance may be found, the available evidence suggests that the insurance is not designed to affect the average plan but to provide assistance only to pension plans that are relatively poorly funded.