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CHAPTER 2

____ Infrastructure of Pensions: ____ ____ Tax Policy in the United States ____

The pension asset base in the United States is not subject to a natural rate of growth. Its expansion and indeed its existence depend on an underlying demand for pensions by workers and perhaps by firms as well. These demands are surely heavily influenced by the tax advantages afforded pensions. Tax policy is so intertwined with pension policy in the United States that it is difficult to understand any important aspect of pensions without first coming to grips with related tax policy.

UNDERLYING DEMAND FOR PENSIONS: TAX STRUCTURE IN THE UNITED STATES

Several theories can be advanced to explain the emergence of pensions as a major form of compensation during the post-World War II period, some of which are discussed below.¹ But it is hard to envision a serious challenge to the theory of pensions that finds its basis in the U. S. tax structure. Marginal tax rates in the U. S. Tax Code are very high (the median taxpayer is in the 25 percent tax bracket) and very progressive. But the code awards significant tax concessions to individuals who use pensions as vehicles to save for retirement. It is easy to demonstrate that if workers make optimum use of pensions, they can reduce their lifetime tax liability by 20–40 percent. The nature of the tax advantage

¹For a more complete treatment of these issues, see Richard A. Ippolito, "Public Policy Towards Private Pensions," *Contemporary Policy Issues*, a supplement to *Economic Inquiry*, April 1983, pp. 53–76; for a different treatment, see Alicia H. Munnell, *The Economics of Private Pensions* (Washington, D. C.: Brookings Institution, 1982).

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takes two forms: income smoothing and the tax-exempt status of pension plan earnings.

Income Smoothing with Progressive Taxation

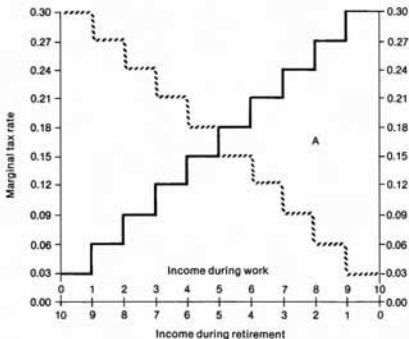
First, consider the special personal income tax treatment afforded pensions. When income is taxed according to a progressive tax scale, the ability to defer taxation on pension savings until retirement confers sizable tax benefits on individuals. Individuals can avoid paying high marginal tax rates on pension contributions during their working lives and instead can pay considerably lower inframarginal tax rates when they receive their pension benefits during retirement.

For example, consider a worker in the 33 percent tax bracket. If the firm creates a pension plan so that a portion of salary is replaced by a pension of equal present value worth, the "first" dollars of pension savings will reduce tax liabilities during working years by 33 cents per dollar and be essentially untaxed as the "first" dollars of retirement income. As more pension savings occurs, subsequent tax savings fall below 33 cents per dollar because the worker falls into lower marginal tax brackets during work years while implicitly diverting more income toward pensions; at the same time, the worker's tax bracket during retirement increases as the expected pension increases. The accumulation of tax savings on the entire "transfer" of taxable income from working years to retirement years is substantial.

The principle of income smoothing is illustrated in Figure 2-1. For illustrative purposes, a very simple "two-period" example is used. The individual works for one period and retires for one period (then dies). The tax rate schedule is a simple linear variety: the marginal tax rate increases by 3 percent for each \$1 of income; there are no deductions (except for pensions). The worker earns \$10 during a work period and the interest rate is zero.

In this example, the individual is taxed 3 cents on the 1st dollar earned, 6 cents on the 2nd dollar, and 30 cents on the 10th dollar. The individual's tax schedule is shown by the left-to-right upward-sloping solid line in Figure 2-1. Total tax is \$1.65 (the sum of the taxes levied on each marginal dollar of income) or 16.5 percent of the individual's income. Now suppose the individual wants to save half of these earnings to consume during retirement. Without the use of a pension, the individual simply saves one half of the after-tax income to support consumption during retirement. With the use of a pension plan to do this savings, the individual's tax levy is altered: the individual is untaxed on this savings during the work period, and in exchange is taxed upon taking these savings in the form of retirement income. Because of tax progressivity, this reallocation of taxable income from the work period to the retirement period is valuable.

FIGURE 2-1 Tax Advantages of Income Smoothing through a Pension



The worker's tax gain from using the pension can be neatly shown by counting retirement income in the reverse direction from worker income on the horizontal axis, as shown in the figure. A "reverse" tax schedule for retirement income is shown by the right-to-left upward-sloping dotted line. The first dollar of wage given up in exchange for the first dollar of pension income was taxed at 30 percent; as retirement income, it is taxed at 3 percent, a 27-cent tax savings. The second dollar earned was taxed at 27 percent; as retirement income, it is taxed at 6 percent, a reduction of 21 cents in tax liability. The tax gains continue to accumulate (at a diminishing rate) until the fifth dollar saved, which was taxed at 18 percent as income during work; as pension income during retirement, it is taxed at 15 percent; thus, there is only a 3-cent tax gain on the last dollar saved. All told, tax savings, which are neatly represented as area A in Figure 1, amount to 75 cents (that is, 27 cents plus 21 cents plus 15 cents plus 9 cents plus 3 cents), 45 percent of the \$1.65 tax bill incurred without the use of pensions.

While these calculations are made for illustrative use only, it is possible to calculate the potential magnitude of these tax savings for a

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TABLE 2-1 Income-Smoothing Tax Benefits of Private Pensions

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Annual Income	Lifetime Income (\$000)	Lifetime Tax without Pension Tax Deferral (\$000)	Lifetime Tax with Pension Tax Deferral (\$000)	Lifetime Tax Savings from Pension Tax Deferral (\$000)	Pension Tax Savings ÷ Lifetime Taxes ((5) ÷ (3) × 100)	Pension Savings ÷ Before-Tax Retirement Income (× 100)
\$ 5,000	\$ 200	\$ 0	\$ 0	\$ 0	—	—
10,000	400	28.3	17.2	11.1	39.3	11.3
20,000	800	111.5	89.5	22.0	19.7	11.2
30,000	1,200	224.7	184.9	39.8	17.7	13.5
40,000	1,600	368.0	303.3	64.7	17.6	16.4
50,000	2,000	541.4	444.4	97.0	17.9	19.7
60,000	2,400	744.8	608.6	136.2	18.3	23.1

The tax structure used in this table was estimated from the 1979 Internal Revenue Service, *Statistics of Income*. The average wage in 1979 was approximately \$14,000.

more realistic lifetime model, using the basic characteristics of the effective U. S. tax structure.² Such a model is described in Appendix 2-1. An essential characteristic of the model is a zero interest rate. Thus the tax benefits from income smoothing alone are calculated, not the additional tax savings attributable to the tax-free status of pension earnings during the accumulation period; these are calculated separately below. It is also assumed that the individual is covered by a pension at age 25, benefits commence at age 65, the individual dies at age 78, and the rate of income over the individual's working life is constant. Finally, it is assumed that there is no social security system.³ In the model, the individual maximizes the benefits of the special pension tax treatment by smoothing taxable income over a lifetime.

The results of this simulation are presented in columns 1 through 7 in Table 2-1. The numbers shown in the first two columns represent various hypothetical annual gross income categories and lifetime income (assuming 40 years of work). These numbers pertain to the year 1979 when the median annual nonagricultural wage was approximately \$14,000 per year. Numbers in columns 3 and 4 show the lifetime tax liabilities with and without pension coverage; column 5 (column 3 minus column 4) exhibits the absolute tax savings attributable to the income-smoothing aspects of pensions; columns 6 and 7 show the tax savings attributable to pensions as a percent of lifetime tax liabilities and pension income.

²The effective tax structure is taken from the Internal Revenue Service *Statistics of Income*, 1979. The basic attributes of the personal tax system in the year 1979 are representative of the system during the entire post-World War II period.

³The introduction of social security increases the overall tax benefits found in a pure private pension system; see Appendix 2-1 and Chapter 12.

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It is apparent from the table that taxpayers who elect to be covered by pensions throughout their work lives can reduce their lifetime income tax burden by 20 percent or more. In terms of retirement income, the portion of (before-tax) pension income attributable to income smoothing ranges from 10 to 21 percent depending on income level, but is concentrated in the 10 percent range for typical workers. That is, for the median worker, fully 10 percent of a pension income would have been taken in the form of higher taxes if income smoothing benefits were not available to pensions.

The absolute gain from the pension tax provision increases sharply with income. Individuals at the lowest income level in the table experience no tax gain because they pay little or no tax in the absence of pensions. Individuals in the \$10,000 income range gain the largest percentage amount (almost a 40 percent reduction in tax liabilities) owing to the standard exemption which allows them to escape taxation on a relatively large portion of their pension benefits. The absolute gain to these individuals, however, is only about \$11,000. In the case of individuals in the \$20,000 income range, the proportional tax savings fall to 20 percent, but the lifetime tax savings amount to \$22,000; for individuals in the \$50,000 income range, the tax savings amount to \$97,000.

Tax-Exempt Pension Plan Earnings

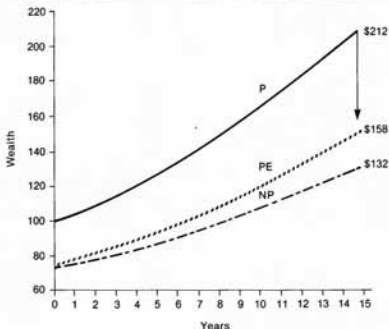
The tax advantages afforded pensions are not limited to their income-smoothing features. To illustrate, and to ensure that no income-smoothing features will be considered, suppose that the income-tax rate is proportional, not progressive. In addition, relax the assumption made above that the (nominal) interest rate is zero. With a positive interest rate, the tax-exempt status of the earnings in the pension plan trust confers large tax savings on workers who implicitly save for retirement using a pension vehicle.

Consider the simple case of a defined contribution plan. In lieu of some portion of cash wages, the firm contributes a fixed percent of the worker's earnings into a defined contribution account; upon retirement a lump sum amount is available to the worker. Compare this method of saving for retirement to one where the individual saves for retirement outside the pension plan. In either case, the firm is indifferent because it can deduct wages or pension contributions; so the firm's tax liability is independent of the form in which its workers receive total compensation. Not so for workers.

Consider a typical worker who faces a proportional personal tax rate of 25 percent. Suppose this individual can choose whether the firm should either add \$100 to her cash wage per year or contribute \$100 to a defined contribution plan. If the worker does not use the pension

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FIGURE 2-2 Value of Accumulation through a Pension Savings Vehicle



Legend: P- Saving in a pension vehicle
PE- Saving in a pension equivalent vehicle
NP- Saving in a non-pension vehicle

Assumption—Saving \$100 before-tax income in year zero for consumption in year 15; 25 percent tax rate, 5 percent interest rate.

plan, the \$100 "extra" wage is assessed a 25 percent personal income tax, leaving \$75 free to save. Suppose the interest rate is 5 percent and consider a particular year in the worker's tenure; for example, consider the point 15 years prior to retirement. The \$75 will not grow at the rate of 5 percent; savings outside the pension program are subject to the personal income tax; thus, the after-tax interest rate is 3.75 percent $[= 5.0 \times (1.00 - .25)]$. After 15 years, the \$75 savings are worth \$132 in after-tax income. This case is denoted in Figure 2-2 by the bottom solid growth line labeled NP (no pension) which originates at \$75 and ends at \$132 after 15 years.

Now suppose the pension plan is used instead. If the \$100 is deposited into the pension plan, no immediate tax is assessed; instead it will be assessed as taxable income at retirement. It turns out that this deferment as such does not affect the present value tax liability. What

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is important is that during the accumulation period, all interest earned in the pension plan is tax-exempt. Thus, the \$100 grows at the gross-of-tax rate of 5 percent per year, not the after-tax rate 3.75 percent; after 15 years, the \$100 is worth \$212. See the top solid growth line labeled P (pension) in Figure 2-2. Upon retirement, the lump sum is subject to the proportional 25 percent tax. After the tax is assessed, \$158 in after-tax income is available to the worker. This is equivalent to the worker being assessed a 25 percent tax on the \$100 in savings immediately but then having the opportunity to earn the full 5 percent interest rate on these savings; this alternative is shown by the dotted growth line labeled PE (pension equivalent) in Figure 2-2 which yields the same \$158 after-tax income as the pension vehicle after paying the tax at retirement. Viewing the pension tax advantage in this way, one can see that the value of the pension is not that the income tax is escaped or deferred, rather that it exempts these savings from the so-called second tax during the accumulation period.

Compare the two results. With a pension, the \$100 "extra" wage at age 50 is worth \$158 at age 65, after tax; without a pension, the same \$100 is worth \$132, after tax. The difference of \$26 is attributable to the tax-exempt status afforded earnings in the pension plan. In this example, fully 16 percent ($= 26/158$) of the (after-tax) lump sum pension would not otherwise be available to the worker if pension earnings did not enjoy tax-exempt status.

This example can be easily generalized to the full work life. That is, if we assume that retirees maintain a constant pension savings rate over a 30-year period, it is straightforward to calculate the tax benefits attributable to tax-exempt accumulations under the assumption that the income-tax rate is proportional. The results of such an exercise for several interest rate and tax rate assumptions are reported in Table 2-2.⁴ Consider the case, for example, where the tax rate is 10 percent, which roughly corresponds to the average tax rate paid by the median worker in the simulation reported in Table 2-1. When the (nominal) interest rate is 5 percent, 6.4 percent of the retiree's (gross-of-tax) pension would have gone to the government through higher tax liabilities had the tax-exempt pension not been available; if the interest rate is either 8 or 12 percent, the percent savings would be 10.0 or 14.4 percent.

⁴Suppose contributions in the pension plan are S in the first year of tenure and grow at the rate of g percent (reflecting inflation and real wage growth). If this savings flow is deposited in conventional vehicles, the savings is subject to normal income taxation before it is deposited, then tax is assessed on the interest earned in each period. Hence, the after-tax balance after R years of accumulation is

$$B = (1 - t)S \int_0^R e^{g(1-t)(R-j)} dj$$

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TABLE 2-2 Tax-Exempt Earnings Benefits of Private Pensions

Nominal Interest Rate	Tax Gains from Interest Tax Exemptions: Percent of Pension Income (Percent \times 100)		
	10 Percent	Proportional Tax Rate ^a 17.5 Percent	25 Percent
.05	6.4	9.9	12.4
.08	10.0	15.1	18.6
.12	14.4	21.2	25.5

The results in the table represent the portion of (before-tax) pension retirement income that would otherwise have been collected as tax on interest earnings if the same pension contributions had been saved outside the tax-exempt pension plan. The results are based on the assumption that the pension savings rate is constant over a period of 30 years.

^aThe 10 percent tax rate corresponds roughly to the average tax rate assessed on the median taxpayer in Table 2-1 (earning \$14,000 per year); the 17.5 percent tax rate corresponds roughly to earners in the \$30,000-\$40,000 range in the table; the 25 percent tax rate corresponds to earners in the \$50,000-\$60,000 range.

The results show what is intuitively obvious; the importance of the tax exemption increases with the interest rate. The results also show that the tax benefits increase rapidly in a proportional sense with higher tax rates. For the case of the 25 percent tax rate which corresponds roughly to the income ranges \$50,000-\$60,000 in Table 2-1, the percent of pension income attributable to the tax-exempt feature of pension earnings is 12.4, 18.6 and 25.5 percent for the 5, 8 and 12 percent interest rate assumptions.

Compare the results of Table 2-2 with those shown in column 7 in Table 2-1. For the typical wage earner (in the \$10,000-20,000 range in 1979), approximately 10 percent of his pension income is attributable to income-smoothing tax advantages. The gains attributable to the tax-

where i is the interest rate and t is the proportional tax rate. If a pension is used instead, the savings is deposited before tax and is accumulated tax free, the entire balance subject to normal income taxation at the end of the accumulation period as it is taken as retirement income. In this case, the savings balance at retirement is

$$P = (1 - t)S \int_0^R e^{i(R-j)} dj.$$

Thus the portion of before tax pension income attributable to the tax-exempt status of pension accounts is

$$d = (1 - t)(P - B)/P.$$

The value of the variable d is reported in Table 2-2 for different values of the interest rate and tax rate. For purposes of the calculation, it is assumed that $g = i$, which means approximately that savings are a constant portion of wages over life.

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TABLE 2-3 Pension Plan Coverage, Private Sector, 1979

<i>Estimated Annual Earnings*</i>	<i>Percent Covered by Pensions</i>
< \$5,000	10
\$5,000-\$9,999	31
\$10,000-\$14,999	54
\$15,000-\$19,999	72
\$20,000-\$24,999	77
\$25,000 or more	78
Average	50

*Annual earnings were estimated by multiplying average weekly wage, or salary income as reported on the May 1979 Current Population Survey (CPS) by weeks usually worked per year as reported in the pension supplement to the May 1979 CPS.

SOURCE: Daniel Bellef, "Coverage Patterns of Full-time Employees under Private Retirement Plans," *Social Security Bulletin* 44 (July 1981), pp. 3-11.

exempt status of pension earnings for these workers (column 1, Table 2-2), at least for the 8 percent interest rate, would be the same order of magnitude. For workers in the \$50,000 income category (in 1979), the income-smoothing gains amount to approximately 20 percent of pension income; the tax-exempt advantages for the 8 percent interest rate case amount to 18.6 percent of retirement income (last column in Table 2-2). By using pension plans to save for retirement compared to conventional savings vehicles, the combined pension tax advantages award middle-income workers after tax retirement incomes that are approximately 25 percent higher than they would otherwise be if workers used conventional savings vehicles to accumulate their retirement income. For higher wage earners, even for interest rates in the range of 5-8 percent, the tax gains could represent 30-40 percent of pension retirement income. It is therefore easy to see why workers would have a strong incentive to prefer pensions as a form of compensation when marginal tax rates are high.

Empirical Evidence

Available evidence is broadly consistent with a personal income tax theory of pensions. Cross-section observations show a strong positive relationship between the probability of pension coverage and income level. For example, consider the pension coverage rates for 1979 reported in Table 2-3. Workers earning below \$5,000 per year exhibited a 10 percent coverage rate; the rate increases over higher wage levels until it reaches 78 percent coverage for workers earning more than \$25,000 in 1979. The time series evidence also appears to be consistent with the tax theory of pensions.

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TABLE 2-4 Marginal Federal Tax Rates and Pension Assets 1920-1980

Year	(1) Marginal Federal Personal Income Tax Rate Paid by Median Taxpayer (Percent)	(2) Number of Personal Income Tax Returns on which Taxes Paid, per 100 Workers (Percent)	(3) Noninsured Pension Assets (Book Value - 1980 Dollars)		(4) Marginal Corporate Tax Rate Paid by Large Firms (Percent)
			Per Capita	Per Worker	
1920	4.0%	13.3%	2	5	10.0%
1925	1.1	5.5	8	16	13.0
1930	1.1	4.2	35	69	12.0
1935	4.0	4.1	60	108	13.7
1940	4.4	13.2	82	147	24.0
1945	23.0	65.3	124	202	40.0
1950	17.4	59.7	209	349	42.0
1955	20.0	65.6	444	742	52.0
1960	20.0	67.3	773	1,290	52.0
1965	20.0	70.3	1,203	2,023	48.0
1970	19.0	69.8	1,478	2,423	49.2
1975	21.0	64.4	1,435	2,327	48.0
1980	21.0	68.1	1,517	2,367	46.0

SOURCES: (1) 1920-60, J. A. Pechman, *Federal Tax Policy*, 3d ed., (Washington, D.C.: The Brookings Institution, 1977), 1965-80, annual volumes of *Statistics of Income: Individual Income Tax Returns*, U.S. Treasury, IRS. (For 1920-60, the marginal rate equalled the first tax bracket rate.) (2) 1960-80, number of taxable returns from *Statistical Abstract*, 1984, p. 327; labor force data from same, p. 405. For 1920-55, number of taxable returns from *Historical Statistics of U.S.*, Vol. II, p. 1110; labor force data from same, Vol. I, p. 127 (except 1940, 1945, from *Economic Report of the President*, 1982, p. 266). (3) Assets: 1920, 1925 from R. W. Goldsmith, *A Study of Saving in the United States*, (Princeton, N. J.: Princeton University Press, 1955) Vol. I, p. 468; for 1930-80, American Council of Life Insurance, *Pension Facts*, Washington, D. C., 1982, Table 8, p. 19. Population and labor force data: same sources as for labor force data in (2) above. Values adjusted by CPI. (4) 1920-75, J. A. Pechman, *Federal Tax Policy*, pp. 302-3; 1976-80, *Statistics of Income: Corporate Returns*, 1981, p. 76.

In particular, consider whether the tax theory can explain the emergence of pensions after World War II. In Table 2-4, the average marginal tax rates paid by taxpayers and the proportion of tax returns on which any tax was paid are shown in columns 1 and 2. In 1940, only 13 percent of income earners paid taxes; and these paid a median marginal tax rate equal to 4.4 percent. By 1945, 65 percent of income earners paid a tax with a median marginal tax rate equal to 23 percent. The dramatic increases in tax rates and tax coverages that took place during World War II were never reduced thereafter. Did these tax structure changes lead to increases in pension coverage?

To answer this question, some measure of the importance of pensions must be chosen. Pension assets are probably the most consistent and reliable pension data series available, and the one of central interest to this study. As long as pensions are relatively well funded, an issue discussed in more detail below, this measure incorporates pension coverage and size of benefits promised; thus, if funding ratios are roughly constant over time, assets are a relatively good measure of pension liabilities incurred. Because of data limitations prior to 1950, readily available data pertaining to noninsured pension assets expressed on a

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book-value basis are used; later, more reliable data from 1950 on will be developed. Expressing these assets (in real terms) on a per capita and per worker basis provides measures of the importance of pensions in the economy. These indexes are shown in column 3 of the table.

The data show that the decade following the tax increase during World War II marked a period of substantial growth for the U.S. pension system; per capita pension assets (in 1980 dollars) increased from \$209 in 1950 to \$773 in 1960 and to \$1,478 in 1970. Pension asset growth outside the period 1950–1970 has been relatively small. The time series data are therefore broadly consistent with the notion that income taxes could be substantially responsible for the growth of pensions as measured by per capita pension assets.

FRAGILITY OF THE PENSION SYSTEM: RAMIFICATIONS OF POTENTIAL CHANGES IN TAX LAW

Three Tax Alterations Considered

Projections of the size of the pension system implicitly assume infinite durability of current tax law. Yet the system would be substantially altered if any one of many tax proposals that have been recently considered are ultimately adopted. It is apparent that the system is sensitive to tax law that directly applies to pensions. It is less apparent that the system is also sensitive to tax law changes unrelated to pensions, as such.

To illustrate, assume that the current pension tax code will remain unaltered; that is, assume that tax deductibility of pension contributions at the corporate level, tax-exempt pension trust status, and deferment of personal tax assessment until retirement will remain intact. In addition, consider the implications of three popular tax proposals: the flat-rate tax, the consumption tax, and the elimination (or substantial enhancement) of IRA limits. Ramifications of these tax policies for pensions are considered, assuming that tax advantages are primarily responsible for the existence of pensions. Potential alternative theories of pensions are then discussed; to the extent that these alternatives are plausible, the current pension structure will be more durable in the face of changing tax law.

Flat tax. While there are many alternatives on the same basic theme, a flat tax concept would essentially replace the current progressive income tax with a single rate formula. It is apparent from the discussion above that if this concept is enacted, the income-smoothing tax benefits of pension plans will be eliminated, roughly half of the tax savings affiliated with optimum use of pensions. Thus, the demand for pensions will undoubtedly fall. Two additional repercussions will ultimately be felt from this policy in the pension industry.

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First, it is intuitively apparent that maximum income-smoothing tax gains are found when taxable income is equalized over life. In the simulation above, it was assumed that this is precisely what workers did. But because of the availability of social security and perhaps other savings, and possibly because workers may want to consume less during retirement than during the work life, workers will almost certainly not wish to have pensions equal to their income during their work lives. Nevertheless, because of the tax advantages of income smoothing, it is equally certain that workers will want larger pensions in the face of a progressive tax system than a flat tax system: the "oversaving" done to take advantage of the income-smoothing tax provisions will disappear under a flat tax. Consequently, the pension system will be reduced in size.

Second, while the tax-exempt feature of the pension trust will remain intact in a flat-tax system, the size of the tax gains affiliated with the tax-free account vis-à-vis a tax-exposed savings account will almost surely be reduced. The reason is that most flat tax schemes also involve a sharply reduced tax rate. For example, a flat tax would likely be set in the vicinity of 20 percent.⁵ Compare this with marginal tax rates that range up to 50 percent under the current tax code. If marginal tax rates fall, so also do the tax gains affiliated with tax-free pension accumulation vehicles. For example, the tax-exempt earnings benefits evinced in Table 2-2 for a 10 percent tax rate are approximately half the benefits affiliated with a 25 percent tax rate.

In short, while a flat-tax concept would not entirely eliminate the tax advantages enjoyed by pensions, it would sharply reduce their magnitude. As such, it could be expected that if a flat tax were enacted, workers in the long run would save less income in the form of pensions in comparison to other savings vehicles. The financial industry would not necessarily be affected because some of this savings would be made in other savings vehicles. But service providers to pensions as such would no doubt feel substantial reductions in demand. If the flat tax concept were enacted, the pension asset base projected under current tax law would surely be unsustainable.

Consumption tax. Consumption-tax concepts also come in many forms but in essence a consumption tax does precisely what a pension plan uniquely does under the current tax code: it permits postponement of taxation on personal income until the time it is actually used to support consumption; interest on savings during the accumulation period are tax exempt. Since this tax change would strip pensions of their

⁵Recent proposals have reflected a so-called modified flat tax. The U.S. Treasury *Tax Simplification and Reform Proposal* (Washington, D.C.: U.S. Government Printing Office, 1984) has a maximum tax rate of 35 percent; the Bradley-Gephardt proposal (S 1421, HR 3271), 30 percent; Kemp-Roth (S3271, HR 5533), 25 percent. All proposals maintain numerous deductions and have three tax rate steps, and hence are not true flat tax proposals.

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unique "consumption tax" status, in effect creating a whole array of competing savings vehicles for retirement, the tax advantages of pensions in effect would be eliminated. The repercussions of this change in the tax code for pensions would no doubt be as dramatic as they are obvious—substantial reductions of the pension asset base largely offset by substantial increases in nonpension assets.

Elimination of IRA limits. Until 1974, the "consumption tax" features of the tax code were made available to workers only if they obtained a pension through the firm. Arguably, had workers been given the option of saving privately for their retirement, say through unlimited Individual Retirement Accounts, the pension system as it is known today would never have developed. If workers have access to savings accounts for retirement that are equally tax favorable to pensions, it is unlikely that firm-offered pensions would be the unanimous choice of workers as a vehicle to save for retirement.

In 1974, with the enactment of the Employee Retirement Income Security Act, IRAs (subject to a \$1,500 annual contribution limit) were permitted; in the Economic Recovery Tax Act of 1981 IRAs (up to \$2,000 per year) were made available even to workers who were covered by firm-offered pensions. But these limits may be constraining for most workers; moreover, since contribution limits are defined in nominal terms, there is a justifiable suspicion that the limits in real terms may dwindle sharply and unexpectedly, making them an unreliable substitute for pensions. If Congress enacted more generous limits, the ensuing repercussions would be very much like those affiliated with the enactment of a consumption tax.⁶

Alleviating Factors: Other Reasons for Pensions

The above scenarios are predicated on the assumption that pensions exist primarily because of their tax features. To the extent that this is not an accurate depiction of the pension industry infrastructure—if pensions exist at least partly for reasons unrelated to the tax code—the system may prove somewhat more durable in the face of tax changes than depicted above. Two plausible candidates are considered here: pensions are a device used to affect productivity, and pensions provide convenient ways to offer group annuities.

Enhancement of productivity. While a tax theory of pensions is broadly consistent with the data, it does not appear to be an entirely adequate explanation of pensions because it fails to explain why pension plans typically impose penalties on individuals who quit the firm

⁶For example, suppose IRA limits were put on par with contribution limits for Keoghs or defined contribution plans, roughly \$30,000 per year.

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before normal retirement ages. The penalties imposed by pension plans take the form of rules that relate promised vested pension benefits to final wages. When inflation and/or productivity increases are substantial, the vested benefit for past service is considerably higher for individuals who stay with the firm until retirement. It has been argued that these penalties may be better explained by a theory that has pensions acting as a deferred wage, thereby working to reduce shirking (through fear of firing) and costly quit behavior.⁷

More troubling, perhaps, is the observation that firms do not take full advantage of the tax preferences awarded to pensions. Pension plans are substantially underfunded (see Chapter 4); that is, even though firms could reduce their tax liability by fully funding their plans, they typically choose to save a portion of their implicit pension contributions outside the pension plan.⁸

It is not immediately apparent why deferred wages through a pension vehicle were suddenly efficient only in the 1950s when pension growth substantially occurred. But reflection upon the pattern of tax rates at the corporate level lends credibility to this theory. In particular, the firm can accumulate deferred wages tax free through a pension plan but must pay corporate taxes on accumulations outside the plan. Therefore, if it is optimal for the firm to defer wages, it is tax preferable for the firm to choose fully funded pensions as the appropriate vehicle to accomplish this goal. The higher the corporate tax rate, the greater the advantage to the firm of using a pension plan rather than a straightforward deferred wage scheme. Since the corporate tax rate also exhibited a substantial increase in the 1940s (see Table 2-4), it is plausible that firms largely switched their deferred wage vehicles in favor of pensions thereafter. This theory is not entirely independent of a tax explanation, just from a personal tax theory. The theory says that as long as the corporate tax remains high, pensions will remain popular regardless of the level and form of personal taxes.

It is also not apparent in the context of the deferred wage theory why the penalty of leaving the firm (voluntarily or involuntarily) is

⁷See Dennis Logue, *Legislative Influence on Corporate Pension Plans* (Washington, D. C.: American Enterprise Institute, 1979); and Edward Lazear, "Pensions as Severance Pay," National Bureau of Economic Research, Working Paper No. 54, 1982. The nature and potential magnitude of pension penalties imposed on workers who quit the firm prematurely are articulated in Chapter 8.

⁸Even if cash flow factors prevent immediate full funding of plans, firms could profitably play an arbitrage game with the federal government. The firm can float bonds at the corporate level and in turn contribute the proceeds to the pension plan. The plan earns tax-free interest on its holdings, but the firm deducts interest it pays on its bonds. See Irwin Tepper and A. Affleck, "Pension Plan Liabilities and Corporate Financial Strategies," *Journal of Finance* 29 (December 1974), 1549-64. The underfunding issue is discussed in more detail in Chapters 9 and 10.

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dependent on the inflation rate.⁹ The persistence of this phenomenon through recent high inflation periods, however, may be partly attributable to federal regulations. ERISA precludes the use of significantly delayed vesting or other mechanisms that work to impose explicit penalties on individuals who leave early. Thus, firms may be forced to depend on a second best solution, one that is not entirely within their control.

Moreover, like the tax theory, the deferred wage theory also has difficulty explaining the existence of defined benefit plans. That is to say, defined contribution plans can be arranged in ways that also discourage early departure from the firm. Not only could vesting requirements be imposed in these plans but firms could exercise their option to cash out separated employees, thereby depriving these individuals (prior to ERISA) of the opportunity to continue to accumulate their pension savings at a tax-free rate. This penalty would be expected to be proportionally greater, the further the separated individual is from his normal retirement age.¹⁰ Thus, it would appear that defined contribution plans could also be used to deter quits and to reduce shirking.

Convenience and economics of group annuities. The demand for fair annuities might also explain part of the demand for private pensions. It has been shown that in the absence of fair annuities, a rational group of individuals with no bequest motive will, under plausible conditions, leave at least one third of their collective wealth to their heirs.¹¹ The phenomenon occurs because each individual attempts to protect himself from outliving his financial resources and thereby holds back on his rate of consumption during retirement.

If the group can purchase fair annuities, they can raise their collective consumption rate to eliminate unintended bequests. But an-

⁹Suppose that at age 54, an individual would be entitled to \$1,000 in lump sum pension benefits (payable at age 65). If the worker actually retires at age 65, the \$1,000 benefit will presumably have been adjusted for inflation during the 11 years he waits between ages 54 and 65 to retire (plus additional pension benefits will accrue). His premature departure at age 54 will be costly to him because he must wait until age 65 to start collecting his pension. In the meantime, the real value of his pension will erode with inflation. If the inflation rate is 2 percent, he stands to lose 33 percent of his real accumulated pension; if the interest rate equals 8 percent, he will lose 80 percent of his real pension benefits. These calculations are discussed in more detail in Chapter 8.

¹⁰Since ERISA, cash-outs can be rolled over into IRAs, thereby depriving firms of the use of cash-outs to discourage early departure. Also, prior to ERISA, the cash-out was treated as a long-term capital gain for tax purposes. This preferential tax treatment would in many cases equal the tax advantage of income smoothing associated with pension payouts during retirement. Thus, the tax penalty imposed by a cash-out was not found in the elimination of the benefits of income smoothing, but rather in the forgone opportunity to continue to accumulate at a tax-free rate.

¹¹See Larry Kotlikoff and A. Spivak, "The Family as an Incomplete Annuities Market," *Journal of Political Economy* 89 (April 1981), pp. 372-91.

nuities purchased at older ages are costly because of classic selectivity problems. People who prefer annuities tend to be those who have private information suggesting they will live to be relatively old; those expecting relatively early death will take the lump sum. Retirees with average life expectancies therefore are faced with relatively low annuities because the pool is overrepresented by people with long life expectancies. If, however, a group of individuals can commit itself early in life and penalize early-outs, the selectivity problem can be overcome and, further, group rates can be obtained.

The theory is plausible and consistent with many pension plan characteristics. It is compatible with the near universal aspects of defined benefit plans that annuity-only options are offered (no lump sums), and that penalties are imposed on premature quits. But the theory is incapable of explaining the unusually rapid growth of the pension system after World War II. Moreover, the theory is inconsistent with the structure of defined contribution plans. Only 2 percent of these plans offer annuity-only options; 98 percent offer either a lump sum and an annuity option or a lump sum-only option.¹² If forced-annuity features are important, why are annuity-only options not equally pervasive in defined contribution plans?

If the annuity theory is important, it would suggest that pension plans—especially the defined benefit variety—would be unaffected by the flat tax or consumption tax concepts. But a substantial increase in IRA limits could have a strong impact. This is so because the annuity function of pension plans could be replicated by (unlimited) IRAs. Individuals can open an IRA account with an insurance firm that offers annuity-only payouts. These accounts may impose substantial front-end "loads" which 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 commitment, a selectivity problem is signaled.

If, on the other hand, the employer pools all willing participants in the firm and negotiates a single IRA contract with an insurer on the participants' behalf, a contract can be written which ties individuals to a long-term commitment but which ensures mobility for the pool as a whole. That is, the insurer can still impose constraints on the age of entry into the plan. He can also impose penalties for early withdrawal. But since no selectivity problem is signaled when the entire pool is

¹²These statistics are based on a U.S. Department of Labor sample of summary plan descriptions for approximately 700 defined contribution plans in 1978.

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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.¹³

The Department of Labor has issued a ruling that allows firms to act as collection and pooling agents of sorts for workers' IRA contributions.¹⁴ 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 significant production efficiencies result from deferred wages; or 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 significant group rate savings are forgone if a firm's entire workforce does not participate in an annuity program.

CONCLUSIONS

A fundamental building block of the pension industry is the tax law upon which it is constructed. The data suggest it is likely that a substantial portion of the pension asset base exists because the tax advantages of a "consumption tax"—income smoothing over life and tax-exempt status of the pension trust—are uniquely afforded to pensions. A reasonable estimate is that 20 percent of pension income during retirement (by the median worker) would otherwise be taken in higher taxes if special tax status were not offered to pension plans. For workers earning more than the median wage, the benefits of pension tax law could amount to 40 percent of their pension income. If these tax policies are substantially altered, it is reasonable to expect that the pension system as it is known today will turn from a high-growth industry to a contracting industry. This does not mean that savings in the economy as a whole would be reduced, just that they would be found in other vehicles besides pension arrangements. It is important to remember that when pension asset growth is discussed in a later section, it is

¹³As 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.

¹⁴See 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) from imposing the usual penalties for leaving early or from setting limits on the latest age at which participation can begin.

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predicated on the assumption that the basic tax infrastructure which supports the system remains in place.

APPENDIX 2-1

Simulation Results: Tax Consequences of Private Pensions

1. Private Pensions

The order of magnitude of the potential tax benefits generated by the private pension system can be determined by using a simple life-cycle model.¹⁵ In particular, suppose that the interest rate and the individual's time preference rate are zero; that the individual's age of retirement (as a proportion of adult life) N , age of death (denoted by $N = 1$), and constant rate of income (gross of tax payments and pension savings) W are exogenously given; that utility (U) in any period is dependent (separably) on current consumption and leisure and is temporally independent; and that there is no bequest motive. Under these conditions, lifetime utility is specified as

$$U = NU(C_N) + (1-N)U(C_L) + \text{Leisure terms}, \quad (2-1)$$

where C_N and C_L are the consumption rates during work and retirement years.

Without private pensions, the individual's lifetime budget constraint is:

$$NW = NC_N + (1-N)C_L + N \int_0^W t \, dI, \quad t'(W) > 0, \quad (2-2)$$

where I is taxable income, and t is the marginal tax rate. The last term in expression (2-2) represents the individual's income tax payments; tax progressivity is assumed. It is easily verified in this model that utility is maximized if consumption is spread evenly over life ($C_N = C_L$) which in turn determines the individual's private savings rate.

The pension tax concession granted by the U.S. tax system occurs because employers' contributions to pension plans are not taxable to the individual in the form of current income but are assessed when the individual receives a pension during retirement. The individual therefore transfers a portion of taxable income that would be taxed at high

¹⁵For a more complete discussion of this model, see Richard A. Ippolito, "Income Tax Policy and Lifecycle Labor Supply," *Journal of Public Economics* 26 (April 1985), 327-347.

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marginal rates to periods in which it will be taxed at lower inframarginal rates starting at zero. In particular, the individual's lifetime budget constraint becomes:

$$NW = NC_N + (1-N)C_L + N \int_0^{(1-s)W} t \, dI + (1-N) \int_0^{sWN/(1-N)} t \, dI, \quad (2-3)$$

where s is the individual's pension savings rate; also recall that $N < 1$.

It is apparent from maximizing (2-1) subject to (2-3) that the individual's optimal pension savings rate is $s = 1 - N$ which yields the result that $C_N = C_L$ and $t_N = t_L$ where t_N and t_L are the equilibrium marginal tax rates during work and retirement years. In short, the individual maximizes utility and tax savings by equating consumption across periods.

Incorporating this optimal solution into the model, it is evident that the tax savings conferred by the special tax treatment afforded private pensions is:

$$X = N \int_0^W t \, dI - \int_0^{NW} t \, dI, \quad N < 1. \quad (2-4)$$

The benefits conferred by the special pension tax treatment are clearly greater for higher income individuals:

$$X'(W) = Nt(W) - t(NW) > 0$$

where $t(W)$ is its marginal tax rate evaluated at income level W .

To derive an explicit solution, $U(C)$ in (2-1) is assumed to take the form $U(C) = C^a$, $0 < a < 1$. The results for a choice of a equal to .5 are reported in the text but the calculations were approximately the same for choices of a equal to either .25 or .75. The tax savings described in expression (2-4) were then calculated.

For the purpose of these calculations, the income tax schedule was chosen to resemble the tax schedule in the United States, accounting for personal exemptions and itemized deductions.¹⁶ All income is assumed to be earned income; hence the 50 percent marginal tax rate limitation applies. Finally, the age of retirement is set equal to 65 years; the age of entry (age zero), at 25 years, and the age of death, at 78 years.

¹⁶For this purpose, the average number of exemptions and the average amount of deductions for each level of income were taken from the Internal Revenue Service, *Statistics of Income*, 1979. Appropriate marginal tax rates were then applied to taxable income.

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The resulting tax liabilities are listed in Table 2-1 and are discussed in the text.

2. Social Security

The model above can be easily modified to incorporate the essence of an actuarially fair social security system. The worker/retiree ratio is constant in the model and productivity growth is zero. The average benefits by income level that prevail currently in the social security system were determined. Accounting for the distribution of retirees across income levels, a tax rate, denoted by g , that precisely generated current aggregate benefits was determined. The tax rate was not levied above the maximum taxable income under social security law. For workers not affected by this maximum, the special tax treatment of social security changes the lifetime tax burden to

$$\text{Tax} = N \int_0^{(1-s)W - .5gW} t \, dI + (1-N) \int_0^{sWN(1-N)} t \, dI, \quad (2-5)$$

where g is the portion of income saved through the social security system.¹⁷

This tax constraint was imposed onto the above model and the optimal pension savings rate was derived, given the announced exogenous social security benefit level. The new tax liabilities were then determined. The resulting increase in tax savings is discussed in Chapter 12.

¹⁷For workers affected by the maximum taxable income, the upper limit in the first integral is $(1-s)W - .5gW_{\max}$ where W_{\max} is the maximum income subject to social security taxation. The results were generated assuming that borrowing against social security benefits was possible; the results are not substantially different when borrowing is not possible.