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PENSION REFORM AND SAVING

by

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Abstract and Summary

One justification for proposals to increase funding within public or private pension systems is that such a policy will produce an equivalent increase in national saving, reducing the burden placed on the future workers who must support the retired elderly. This paper examines several sources of empirical evidence to determine whether this justification for advanced funding is valid. We estimate the impact of increased pension funding on national saving, both in public budgets and in the private sector.

The first kind of evidence comes from the experience of U.S. state governments in managing their employee pension funds. The behavior of state governments is relevant to the question of whether it is possible to fund a pension system within the public sector. Our results show a high degree of separation between asset accumulation in state employee pension funds and the operations of states' non-pension operating budgets. States that accumulate exceptionally large reserves within their pension funds do not act as though the funds are available to finance non-pension government operations or to provide short-term relief to state taxpayers.

On the other hand, an examination of the experience of *national*-level governments that have attempted to pre-fund a portion of their public pension liabilities shows a very different budgetary response to pension fund accumulation. A large proportion (60 –100 percent) of the fund accumulation in national social insurance systems is offset within the government sector by larger deficits in other budgetary accounts.

We argue that the contrasting results for U.S. states and OECD nation states can be traced to differences in the governance of the pension systems and the degree of effort that is made to separate the pension funding from other budget activities. More fundamentally, differences in legislator behavior at the sub-national and national level may be explained by state competition for low-cost credit and differences in the mobility of taxpayers in the two kinds of jurisdictions. The budgetary decisions of national governments are further complicated by efforts to use fiscal policy as a tool of economic stabilization.

We also examined saving responses within the private sector to fluctuations in private insurance and pension fund accumulation. This requires the construction of measures of private saving that distinguish between the flow of funds into formal retirement accounts and other saving. We found substantial evidence that pension saving substitutes for other forms of private saving. While the experience with voluntary private pension programs is not identical to the situation that would arise under a system of mandatory pension accounts, it does indicate that the potential for asset substitution is a significant problem that would limit the impact of pension funding on aggregate private saving.

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Pension Reform and Saving

by
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Slowing economic growth and population aging in the major industrial countries have placed increased financial strain on pay-as-you-go (PAYGO) public pension systems. Governments have been forced to increase contribution rates and scale back benefit promises in order to maintain the solvency of their pension programs. Continuing financial pressure in these systems has also stimulated interest in fundamentally reforming their design. One proposed reform is to move away from PAYGO financing and toward increased funding of future pension obligations, either within the existing public system or in a new private system. Advance funding of pension obligations is seen as a desirable option from a variety of perspectives. The most appealing argument is that funded pension programs would generate increased aggregate saving. Higher saving and faster capital formation can boost the future national income out of which the consumption needs of the elderly must be financed. Advance funding would thus provide a means by which current workers could provide additional resources for their own retirement, reducing the burden on the consumption of future workers.

The goal of this paper is to examine the implications of greater advance funding of national pension obligations. Increased funding could be accomplished by two different approaches to policy reform. The first would concentrate on building up a financial reserve within existing public pension systems. The second would be directed at scaling back the existing PAYGO system and introducing a new system of private individual accounts. Many

critics of existing public pension systems question the viability of the first approach. They doubt that legislators could exercise sufficient discipline to avoid using funds accumulated in the public pension system to finance non-pension operations of the government – implicitly borrowing from the public pension fund to pay for programs that would otherwise be financed with income taxes or other general revenues.[1] Therefore, they favor the expansion of private retirement accounts, on either a mandatory or voluntary basis.

The buildup of pension reserves in private investment accounts also raises questions, however. As reserves are accumulated in worker-owned retirement accounts, there is a possibility that workers would reduce other forms of household saving. Many workers would be in a position to simply incorporate any new government-mandated account within their own preexisting retirement plan. Thus, both public and privately-funded pension plans have uncertain effects on national saving.

The advantages and disadvantages of funded pension systems are discussed in the next section. Empirical evidence on the efficacy of funding a pension system within the public sector and preventing the extra accumulation from being dissipated through increased deficits in the non-retirement accounts is the subject of the second section. The third section examines the response of private sector saving to the creation of new individual retirement accounts. It considers the extent to which the creation of new individual saving accounts might displace saving in other private retirement or non-retirement accounts.

[1] In the late-1990s, in pledging not to use the Social Security reserve to finance other programs, members of the U.S. Congress resorted to the term "lock box" in referring to the reserve. But with a new Administration and the passage of a few years, the term "lock box" has vanished from the political vocabulary, and the overall U.S. government budget is once again in deficit.

Pension funding and aggregate saving

As their populations grow older, the industrial countries face steep increases in public pension costs. Nearly all the rich countries operate defined-benefit pension programs in which retirees' pensions are tied to their past earnings. Most programs are financed on a pay-as-you-go basis and are funded with payroll taxes imposed on current workers and their employers. Typical proposals for reform have focused on straightforward adjustments to the basic system, ranging from proportional increases in tax rates to various methods of scaling back future benefits, including delays in the retirement age and smaller cost-of-living adjustments to offset the impact of price inflation.

Debate that is limited to these options is inherently divisive. The policy choice between tax increases and benefit cuts resembles a zero-sum conflict in which the benefits or taxes of one generation or group of workers must be sacrificed in the interest of maintaining the incomes of another. The total amount of future resources available for consumption is assumed to be fixed, and the argument is over how to divide that fixed future pie between the young and the old and between high- and low-wage workers.

However, the discussion has also highlighted a third approach to reform. If countries change their pension systems in advance of sharply higher pension costs, it is possible to prepare for the added retirement costs by funding a portion of the future liabilities through increased saving. By boosting capital formation and economic growth, higher saving has the potential to increase the incomes – and the welfare – of future workers and retirees. In effect, the advance funding of future retirement benefits provides a mechanism by which the current generation of workers can pay for a larger portion of its own retirement.

In a pay-as-you-go system, each generation pays for the costs of the currently retired in return for a commitment for the same treatment during its own retirement. Workers who spend their entire work and retirement life under a PAYGO system with constant tax rates will earn a real return on their contributions equal to the growth in the workforce plus the growth in the real wage (Samuelson, 1958, and Aaron, 1966). In other words, the growth in the workforce and in the average real wage defines the growth in the pool of resources available to support retirees.

In the immediate post-World War II years, a PAYGO system looked very attractive. The labor force of most industrial countries was projected to grow at 2 percent or more per year and annual rates of real wage growth were in the range of 3 percent, implying a total return near 5 percent for a fully mature PAYGO system. In contrast, the common view of a funded system involved investing contributions in government securities with a return of 1 percent or less. In the aftermath of the Great Depression, the market for equities seemed far too risky, and many countries lacked private bond markets. Furthermore, most countries instituting a new pension system were unwilling to delay initial benefit payments for several decades, as would have been required under a funded system. There was a desire to address the immediate problem of high poverty among the elderly, and most countries provided benefits to an older generation of workers which had not contributed fully to the system.

The current outlook is much different. The growth of the workforce has slowed dramatically and is projected in many countries to turn negative in the near future. The growth in real wages has fallen to 1-2 percent per annum. There has also been a significant change in the perspective on a funded system because of the emergence and success of private funded pension programs that have been able to earn real returns of 5 percent or more. It is not

surprising that many countries are reconsidering the choice between PAYGO and funded programs.

A funded, or partially-funded, pension system offers several potential advantages over a pays-as-you-go system.[2] The first is the one that most concerns us in the present context, the possibility that increased funding would lead to a rise in national saving and capital formation unless it is offset by reduced public or private saving outside of the pension system. Second, because each cohort of workers finances its own retirement, there are less intergenerational transfers than under a PAYGO system.[3] Furthermore, within the private sector, funded pensions are more secure in being largely isolated from the future well-being of the sponsoring firm. Since governments do not go bankrupt, this is less relevant in the public sector, but a funded public system, by anticipating future retirement costs, may be more secure against some forms of unanticipated change in the demographic structure. Finally, a funded system which earns the average rate of return on capital should be able to obtain real returns above those obtainable in a mature PAYGO system.

There are also important questions about whether a pension program should be public or privately managed. If funds are accumulated in a single national fund, officials of the fund must decide how to allocate assets across a variety of investment options. If instead funds are accumulated in millions of individual investment accounts, decision-making over asset allocation

[2] The arguments for and against a funded public program are evaluated more fully in Hemming (1999).

[3] There are significant transition costs in the shift from PAYGO to a funded system since the transitional generation would seem to have to pay twice, once for previously accumulated claims under the PAYGO system and again for its own funded pensions. However, the unfunded liability of the PAYGO system arises largely as a result of benefit payments to the first generation, and those sunk costs should not be a primary determinant of future choices. Furthermore, the need to raise future taxes to cover the costs of a longer retirement life offers an opportunity to fund the incremental costs without addressing the more divisive issue of who will pay the accumulated past debt.

would be left up to individual workers. Most public pension systems are defined-benefit plans that can easily incorporate a redistribution of benefits between low- and high-wage individuals. The redistributional aspect is particularly important in Canada and the United States. Most proposals for defined-contribution private accounts would rule out redistribution since individuals' benefits would be tied to their own contributions and the earnings on those contributions. Thus, assistance to those with low lifetime earnings would require the continuation of a scaled-down public sector program, or perhaps the introduction of a new one providing a simple flat-rate benefit.[4] Second, public and private plans involve much different approaches to managing investment risks. In a national defined-benefit plan, the risks can be spread across multiple generations. Unexpectedly poor returns on contributions could lead to adjustments in contributions as well as benefits. In private defined-contribution accounts, the financial risks are all borne by the individual contributor.[5]

The focus of this paper, however, is on the potential of pension funding to increase aggregate saving. The assumption that the surpluses of the pension fund will lead to increased national saving is crucial to the notion of using funding as a means of reducing the burden of population aging on future workers. While the impact of pensions on saving has been a much investigated and debated topic, most of the debate has centered around the question of whether the *creation* of public PAYGO systems has reduced national saving.[6] The issue treated in this paper is the impact on saving of a shift from a PAYGO to a fully- or partially-funded system.

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[4] A flat-rate benefit is a major feature of both the British and Japanese systems.

[5] Concerns with the risks have led the governments of countries with defined-contribution plans to advance various forms of minimum guarantees, but these provisions can seriously distort investment incentives.

[6] This literature is reviewed and summarized in CBO (1998) and Atkinson (1987).

The analysis that follows examines two alternative approaches to increased pension funding: (1) Increased funding of the *existing* public pension system, most simply by moving forward the tax increases that would be required in the current PAYGO system; and (2) Creation of a *new* system of mandatory individual retirement accounts, owned and managed in the private sector, to partly offset the benefit cuts that would be needed to maintain solvency of the existing public PAYGO system. In each case, it is important to consider both the budget reaction within the government sector and the saving response of private individuals to determine the impact of the pension reform on aggregate saving.

Public sector funding

If a legislature decided to increase pension funding within the existing public program by accelerating future tax increases, there would be no change in the level of promised future benefits. It is the size of the credible benefit promise – the future liabilities of the system – that should influence private saving, not the magnitude of saving within the fund. Unless the funding of future liabilities makes future benefit promises more credible, the funding of an existing program should have little impact on private saving.[7]

Ignoring for a moment the private saving response of workers who are covered by the public pension system, a critical issue involves the response of saving within the government sector. To a large extent, the public saving response is entangled in the question of whether the pension system represents a function distinct from the rest of the public budget. If the public pension program is just one among many government transfer programs, there is no reason to

[7] In some countries, the issue of credibility may be very important since the existing system is so severely distorted. However, this paper focuses on changes of the pension systems in OECD countries, where the issue of credibility seems less crucial.

separate this spending commitment from other government activities. The pension system's revenues should be seen as part of total revenues as the legislature struggles to allocate its scarce resources among competing claims. The assignment of a specific category of revenues, such as payroll taxes, to a specific expenditure program can be regarded as arbitrary. As long as the pension system is an integral part of the overall public budget, there is no reason to believe that a larger surplus in the fund would actually lead to any increase in national saving. From this perspective, a larger pension fund surplus is likely to be offset within the government budget as a whole, either by a reduction in non-pension taxes or an increase in non-pension spending.

This all-inclusive view of the budget is common among public finance economists in the United States, who have long promoted the view that a single unified budget is the appropriate framework for understanding the activities of the public sector. The U.S. Congressional Budget Office (CBO), for example, has argued against a separate budgetary treatment of Social Security, asserting that the pension system is simply one among many government transfer programs. The CBO has specifically opposed crediting the Social Security trust fund with income on its investments, since that income reflects intra-governmental transfers (CBO, 2002). In the view of CBO analysts, the payroll tax used to finance Social Security benefits simply substitutes for other forms of taxation in the financing of total federal government outlays.

There is another view, of course. Many individuals view the program as a retirement account that give rise to future obligations. Several OECD countries have an explicit goal of funding a portion of their public pension obligations. Canada, Denmark, Finland, Japan, and Sweden accumulated significant public pension reserves. Even the United States has generated large surpluses in its public pension system since the early 1990s.[8] Within the United States,

[8] The experiences of Canada, Japan, and Sweden are reviewed in Munnell and Ernsberger (1989).

state and local governments attempt to fund their employee pension obligations outside their operating fund accounts. A state's commitment to differentiate between the retirement accounts and other budget accounts is not sufficient, however, to automatically produce higher public saving when a government consciously increases it funding of future pension obligations. The government must also avoid the temptation to borrow the surplus of the pension system to finance spending in its other budget accounts. That is, the funding balance of the non-retirement accounts must be determined independently of the balance of the pension fund.[9] Otherwise, an increase in the pension account surplus would not produce an increase net public saving, and governments would have simply used their pension payroll tax to finance current activities.

In the next two sections, we explore the empirical evidence with regard to public-sector saving by constructing two statistical tests. In the first, we examine the response of state governments within the United States to the accumulation of reserves in their funded employee pension programs. In the second, we use data compiled under the international system of national accounts (SNA) to examine the relationship between saving within governments' social insurance accounts and the non-retirement budget accounts of twelve OECD countries.

State pension systems in the United States

U.S. state and local government employee pension plans covered 13.9 million active workers and made pension payments to 6.3 million beneficiaries in 2000. At the end of that year the market value of the assets in state and local government employee pension funds was $2.3

[9] Within the United States, it has been uncommon for the states to directly transfer funds from the pension system to the general budget; but it is possible to change the actuarial assumptions used to compute future liabilities, thereby reducing required contributions to the fund (Munnell and Sundén, 2001).

trillion, or about half the amount held in U.S. private employer-provided pension funds. The vast majority of state employee pension plans provide defined-benefit pensions, and about 75 percent of the employees covered by such plans are also covered by the federal Social Security program.[10] On average, the state pension funds appear to be in good financial condition. A mid-2001 survey of pension plans covering 9.3 million state and local government workers found that the actuarial value of the plans' accrued liabilities amounted to $1.5 trillion while the plans' financial reserves amounted to $1.6 trillion, implying an average funding ratio of 103.8 percent of discounted liabilities (Harris, 2002). The strong financial position of the state pension funds may seem surprising, since the plans are not subject to federal government supervision or funding requirements that govern private sector plans.[11] To some extent the favorable situation is the result of the extraordinary rise in equity markets in the 1990s, and the financial condition has probably deteriorated since the survey was undertaken. Capital losses on investments will require large contributions in future years.

The U.S. Census conducts an annual survey of state and local government finances that includes information on revenues, expenditures, assets, and debt. The Census data are available for the 50 states for the fiscal years of 1977 to 1999. A companion survey collects information on the finances of the public employee retirement programs. Thus, it is relatively straightforward to tabulate information on the revenues and expenditures of the retirement and

[10] Current U.S. law compels private employers, but not state and local government employers, to participate in the Social Security system. However, most state and local governments voluntarily participate in the federal Social Security program.

[11] Most regulations governing private plans were introduced as part of the 1974 Employee Retirement Income Security Act (ERISA).

non-retirement accounts of nearly all state governments. Our analysis is restricted to the state government plans that can be easily matched to the corresponding non-retirement accounts.[12]

A summary of the annual inflows and outflows of the pension accounts is provided in Figure 1. Total contributions to these accounts, measured as a share of U.S. national income, have been very stable over the past quarter century. Essentially all of the growth in pension fund assets has come from the investment income earned on the funds' reserve portfolios. That income consists of interest, dividends, and realized capital gains, but it excludes unrealized capital gains. Expenditures, which include benefit payments and administrative expenses, have grown from 0.4 percent of national income in 1977 to 0.9 percent by 1999. During the same period, the annual net accumulation – or annual saving – in the funds has increased from 0.5 percent to 1.8 percent of national income.

We can estimate a very simple relationship between the fiscal balance of a state's non-retirement accounts, *B*, and the net saving that occurs within the state's pension program, *PEN*. Annual changes in state personal income are included to adjust for cyclical fluctuations in the state economy:[13]

$$(1) \qquad B_{it} = \alpha_i + \beta_i PEN_{it} + \delta_i \Delta Y_{it},$$

where

B_{it} = Balance in the non-retirement budget accounts of the *i*th state in year *t*;

PEN = Net accumulation within the state's pension account; and

[12] We excluded Alaska and Wyoming because of special problems with their budget accounts, and Vermont because of the extreme size of the reported debt.

[13] The personal income data are from the Bureau of Economic Analysis and are deflated by the price index for national Gross Domestic Product.

ΔY = Percentage change in real personal income.

The net accumulation of the pension fund is measured as total contributions, plus investment income, less total expenditures. The measure of investment income includes realized capital gains or losses on asset sales, interest, and dividends. The annual balance in a state's non-retirement account is computed by excluding investment income of the pension account from revenues, and redefining state expenditures to exclude pension benefits and include state contributions to the pension fund. Since state contributions to the pension funds represent payments for accruing new liabilities, they reflect a component of current employee compensation (like wages or sickness pay) and should be treated as a current expense of government. Both the non-retirement balance and pension fund accumulation are scaled by the personal income of the state.

The coefficient on pension accumulation in equation (1) measures the extent to which changes in the pension account are offset by associated changes in net state spending in other budget accounts. Since any potential offset need not be contemporaneous, the specification also allows for lagged effects of pension fund accumulations. The current and lagged percent changes in real state aggregate income are included to control for business-cycle effects on state-level non-pension spending.[14] Equation 1 is estimated using a fixed-effects model that allows for a shift in the constant term, α_i, for each state. With allowance for the degrees of freedom used up to measure lags, we have 1,056 annual observations covering 48 states over the period from 1978 through 1999.

The basic results for the overall balance of the non-retirement accounts are shown in column 1 of Table 1. The current and lagged changes in state-level income are both highly

significant, indicating that there are strong cyclical influences on both state revenues and overall state budget balances. The critical coefficients for assessing the impact of state pension accumulation on overall state budgetary balances are those on contemporaneous and lagged pension saving. These coefficients imply a small and statistically insignificant offset of about 8 percent of the accumulation over a two-year period. When the funds accumulate an additional $100 in extra reserves, the deficit in states' non-pension budget accounts eventually increases about $8. The estimates thus indicate that the additional accumulation of funds in states' pension accounts has essentially *no* impact on the net balance of the rest of state budgets. A higher accumulation in state pension funds is fully reflected as higher state saving.

Our formulation of budget decision making is highly simplistic in ignoring any role of fiscal institutions. Yet, several studies have suggested that institutional restrictions, such as balanced budget requirements, have important effects. Budget rules could influence the fiscal balance either through directly constraining policy makers or through influencing financial market perceptions of default risks. In the latter case, the interest rate ramifications would give policy makers an incentive to follow a conservative fiscal policy.

Two recent studies by Poterba and Rueben (1999) and Lowry and Alt (2001) provide strong evidence that states with strong anti-deficit laws do face lower rates of interest. All of the states except Vermont have some form of balanced-budget requirement; but, as discussed by Poterba and Rueben and by Briffault (1996), there is substantial variation in its stringency, ranging from a simple requirement that the governor submit a balance-budget proposal to a prohibition against carrying a deficit over into the next budget cycle. We use a measure,

[14] The lags on state income also reflect the fact that the budget data are reported for fiscal years, whereas the state income is only available on a calendar year basis.

constructed by Lowry and Alt, to partition the states between those with and without a carryover restriction.

Historical information on the interest rates paid by individual states are not available; but both of the above studies used the results of a semi-annual survey by the Chubb Insurance Company that asked bond dealers to estimate the current yield on 20-year general obligation debt, *relative* to a similar bond issued by New Jersey. The authors of the above two studies provided us with the interest rate data for 37 states in our sample for the full 1978-99 period.

We first estimated a simple OLS equation that relates the relative interest rate premium to the difference from New Jersey in the level of government debt at the beginning of the year, a two-year average of the budget deficit, the categorical measure of the carryover restriction, and a trend. We were able to duplicate the prior studies' finding of a statistically significant correlation between the interest rate and the measures of state debt and the budget balance. In our sample, 17 states had the restrictive carryover provision, and the cross-state regression suggests a small but statistically-significant negative effect. We interpret these results as showing that the Chubb survey does yield a meaningful indicator of market interest rates and that those interest rates are related to debt positions.

Second, we expanded the formulation of equation (1) to include the lagged measure of the market interest rate. We represented the unobserved interest rate for New Jersey with a set of annual dummy variables. The results of that estimation are reported in column (2) of table 1. The sample is reduced from 1034 to 836 observations, and the interest-rate has a small positive effect. However, the coefficients on the pension fund accumulation remain small and insignificant, totaling –0.117. An estimate that is corrected for autocorrelation is reported in column (3). It shows no significant influence on the parameter estimates. We also estimated

separate regressions for states with and without carryover provisions. The coefficient differences between the two samples were small and statistically insignificant.

Finally, it is possible to focus more directly on saving within the non-retirement accounts by excluding state government spending for infrastructure investment. The results from implementing this specification, with and without a correction for autocorrelation, are reported in columns 4 and 5 of Table 1. The coefficients, like those in columns 1 and 2, show nearly complete separation between states' pension and operating budget accounts. While the coefficients on pension saving are negative, they are very small and statistically insignificant.[15] In addition, the interest rate term turns negative and insignificant.

In short, the results using a variety of specifications suggest that there is virtually no impact of incremental accumulations in state pension funds on the fiscal stance of the remainder of state budgets. The extra pension accumulations are not offset by higher dissaving in other state budget accounts, and the accumulations of savings within state pension funds translates into additions to state government savings in the aggregate. By implication, the political process does not negate efforts on the part of state legislators to fund state employee pension obligations. In fact, over the past quarter century, saving within the state and local government pension funds has averaged more than one percent of U.S. national income, while net saving within state non-retirement budget accounts has averaged about 0.3 percent of national income.

[15] It might be possible to argue that these estimates understate the amount of offset because of the endogenous determination of the pension fund accumulation. For example, a deficit in the non-retirement account might induce reduced contributions to the pension fund. The reverse link between the two accounts would bias the offset coefficients toward a positive value. However, when the specification is modified to exclude the current period change in pension accumulation and include only the lagged change in accumulation, there was only a small effect on the estimated offset.

Cross-national evidence

It is also possible to explore the tradeoff between retirement and non-retirement account budget balances within the context of the fiscal decisions of national governments. Partial funding of public pension liabilities has been a stated policy goal of several OECD countries, including Canada, Finland, Japan, and Sweden. The United States has also accumulated a significant Social Security reserve over the past two decades. The face value of U.S. Social Security reserves at the end of December 2002 was $1.38 trillion, or about 13 percent of U.S. GDP.[16]

However, it is not obvious whether the large fund accumulations in public pensions have actually contributed to public saving, since the pension accounts are usually embedded within a broader budget framework. Even though the administrator of a public fund may have used pension system surpluses to purchase marketable investment assets, the net effect of this transaction on public saving depends on budgetary actions outside of the pension program itself. If an increase in the employment tax and a larger surplus in the pension account lead to a greater willingness on the part of legislators to tolerate deficits in non-retirement budget accounts, there may be no net increase in public saving even though pension system reserves are growing rapidly. Kent Smetters (2002), for example, has argued that legislators perceive the retirement trust funds as a cheap source of funds, relative to external sources, such as tax increases. If the government adheres to a target of balance in the overall budget, inclusive of the pension fund, even large accumulations in the pension reserve will have no impact on net public saving.

[16] The Social Security reserve is held as special-issue U.S. Treasury securities. Since the effective yield on the reserves, 6.4 percent in 2002, is higher than the current yield on new marketable Treasury issues, the market value of the reserve is much greater than 13 percent of U.S. GDP.

The issue can be illustrated with respect to the U.S. budget situation in figure 2. Beginning with the 1983 reform act, the Social Security system began to generate significant surpluses under the impetus of rising labor force participation rates and reduced growth in the beneficiary population. Yet, as shown in figure 2, the overall budgetary situation was one of substantial deficits throughout the 1980s. It would appear that the surplus of the Social Security trust fund was simply appropriated to finance other expenditures. The pattern changed significantly in the 1990s when ever-growing social security surpluses were matched by significant reductions in the deficit of the non-retirement accounts. This is also the period when politicians from both parties frequently pledged to set aside the Social Security surplus and let it add to national saving. The Social Security accounts were formally excluded from the regular budget as a means of increasing the separation between the retirement and other budget accounts. Most recently, the situation has reverted back to the pattern of the 1980s, as large surpluses in the retirement accounts are more than offset by deficits in the rest of the budget.

At least for the United States, conclusions about the extent to which public pension saving might add to national saving are highly ambiguous. The experience of the 1980s, when the surpluses of the social security system were more than offset by the increased deficits of the non-retirement accounts, is consistent with little or no additions to government saving, while the 1990s suggest a more favorable perspective. Over the full period of 1983-2002, there is a statistically-significant positive correlation between the balance of the Social Security fund and the On-Budget accounts, but the relationship is very sensitive to the inclusion or exclusion of other variables and variation in the period of estimation.

The ambiguity is evident in table 2, which reports several alternative regression estimates of the relationship between the balance of the non- retirement accounts (On-budget) and the

surplus of the social security system. Column (1) shows a simple regression for 1983-2000 in which the budget balances are scaled by GDP and the percentage change in real GDP is included to account for short-term economic factors. A version corrected for autocorrelation is reported column (2). In both cases a positive coefficient on the Social Security Surplus suggests that it actually has been augmented by a nearly-equivalent amount of saving (reduced deficit) in the other accounts. However, the simple addition of the unemployment rate in columns (3) and (4) to allow for cyclical influences on budget policy reverses the sign on the Social Security variable and suggests more than a full offset. Finally, if the time period is changed by just a few years to correspond to the one used by Smetters (2000), the coefficient becomes an implausible –3.15.[17] Clearly, the small number of observations and a very large undefined movement in the non-retirement account balance make it impossible to obtain a meaningful coefficient.

We have pursued the issue with a much larger sample of observations based on budget data from a number of OECD countries. Within the international system of national accounts, the general government sector is made up of separate accounts for the central government, local governments, and social insurance. The social insurance category is broader than pensions alone, but the balance of the account is dominated by income and outgo from public pension systems.[18] We have information for 13 OECD countries over the period of 1970-2000 covering saving within the social insurance sector and the remainder of general government. This provides a total of 305 observations.[19] We scaled the saving measures by national income.

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[17] The change results from the inclusion of the early years when the Social Security balance was small or negative.

[18] For example, social insurance in the United States includes Social Security, Medicare, and the unemployment insurance program.

[19] The countries are Austria, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, and the United States. The measures of saving are computed as current revenues less current expenditures and thereby exclude the capital account.

Over the 30-year period, average saving within the social insurance accounts ranges from more than two percent of national income in Sweden and Finland to less than one percent in Germany and France. The structure of the estimated fixed-effect regression is basically the same as that previously described for the U.S. states. The non-retirement saving balance is regressed on the balance of the social insurance funds. We expect the coefficient on the social insurance fund balance to range between zero (no offset) and -1 (full offset). We have included the rate of change in GDP and the unemployment rate to account for some of the cyclical influences on budget policy.

The basic results are displayed in Table 3. The unemployment rate and a three-year average of the change in real GDP are both highly significant. The results for pension saving offer a striking contrast to the results obtained for U.S. state governments. The coefficients in column 1 show a very strong inverse relationship between the current and prior year's saving within the social insurance account and the current balance for non-retirement budgetary accounts. The accumulation of an additional one billion currency units in social insurance fund reserves leads to a reduction in the surplus (or an increase in the deficit) of other budget accounts amounting to about 1.26 billion currency units. If this point estimate is accepted at face value, increased accumulation of assets in the public pension system actually *reduces* net government saving. (Note, however, that the point estimate is not statistically significantly different from –1.)

However, the results are sensitive to a correction for autocorrelation in the residuals. The correction yields a more favorable offset of –0.57 that is significantly different from both zero and –1.0 at the 0.1 level. This implies a net positive effect on overall public saving of about 40 percent of the pension accumulation. The source of the sensitivity to autocorrelation is not

evident since the coefficients on the other variables changed by small amounts. However, when we re-estimated the relationship by alternately excluding each of the individual countries, the sum of the coefficients on the social insurance balance varied from –0.8 (excluding Finland) to –0.2 (excluding Sweden). Column (3) reports the results of an alternative formulation that restricted the analysis to the five countries that at one time or another had an announced goal of accumulating a large pension reserve (Canada, Denmark, Finland, Japan and Sweden). In this smaller sample of countries, the estimated offset was -0.64, very similar to the results for the larger sample. On balance, we believe that preference should be given to the estimates that adjust for auto-correlation; but in either case, there appears to be significant offsets to pension fund saving.

Our examination of the international evidence is less favorable than that of Munnell and Ernsberger (1989) who argued that Japan and Sweden had succeeded in isolating their pension funds from the rest of their public budgets. In part, the divergent results may be due to differences in the estimation period, since the Munnell-Ernsberger analysis began in 1960 and ended in the mid-1980s, whereas we have focused on the 1970-2000 period. However, the earlier study relied more on impressions drawn from trends in the data rather than a formal statistical estimation, such as the one reported here.

Reconciliation of state and cross-national evidence

The contrast between the results for the U.S. states and the international sample of nation states is striking. Whereas the U.S. states appear to have successfully funded their pension obligations and isolated this funding from the remainder of state budgets, the international experience and that of the U.S. Federal government suggest a large absorption of any pension

surpluses within the overall budget. What accounts for the difference? Several recent studies have stressed the importance of details relating to pension governance.

The pension programs of the U.S. states are marked by extensive efforts to mimic the organizational structure and governance patterns of private-employer pension systems (Mitchell and others, 2001). Significantly, the accounts of the state pension systems are excluded from the standard published state budgets in which pension costs are shown on an accrual basis. That is, the costs of accrued pension liabilities (contributions to the pension fund) are shown as part of compensation costs in the standard state budget, but the budget does not treat the investment earnings of the pension fund as a current source of state revenues.

The states have also established independent or semi-autonomous boards of trustees which are responsible for the funds' operation and investment policies, including overall asset allocation. Under state law the trustees have a fiduciary responsibility comparable to that of the administrators of private-employer pension plans. They are obliged to manage the pension reserves in the interest of the ultimate beneficiaries – namely, current and future retirees who are covered by the pension program. Nearly all plans are subject to annual actuarial and investment audits. Public reports create a high degree of transparency, and political influences on trustees' investment strategies seem to be small and shrinking over time (Munnell and Sundén, 2001).

U.S. states are also severely limited in their ability to modify their pension programs. While state governments are not subject to federal regulatory oversight under the Employee Retirement Income Security Act (ERISA), state courts have established strong contract protection of state employee and retiree rights, and in some states beneficiary rights are actually spelled out in the state constitution.

More fundamentally, we believe there is a powerful political economy rationale behind the behavior of state legislators. Just as with their financing of public infrastructure investments, state lawmakers are keenly aware of the potential burden imposed by pension obligations on future taxpayers. For the most part they have followed a conservative strategy in pre-funding those obligations. This conservatism is driven in part by states' continuing need to borrow funds in U.S. capital markets. States which follow conservative financing principles in their fiscal accounts can obtain favorable borrowing rates in capital markets, reducing the credit cost of public investment projects and helping hold down state's borrowing costs during recessions, when state operating budgets are frequently in deficit.

Perhaps most crucially, state and local governments within the United States are faced with highly mobile tax-paying populations. They must be concerned that tax-paying residents will move to another jurisdiction if state taxes are not closely aligned to the expected benefits provided by the state government. If a shortfall in current pension reserves causes state legislators to push up tax rates in order to pay for the pensions of already-retired employees, the state's high tax burden will in effect pay for labor services that were rendered in the past. The current tax burden will not reflect the flow of state government services flowing to current residents. Within the United States, taxpayers are free to move to another state where tax burdens are more closely aligned to the current flow of state-provided services. Nation states probably have less reason to be worried that taxpayers will vote with their feet by moving to another country.[20]

[20] However, even nation states must worry about adverse effects on labor supply and aggregate earnings if pension contributions and the pension benefit formula provide poor incentives for workers to seek employment in the social-security-covered sector.

Thus, the accounting practices of state and local governments have followed those of private corporations in moving toward greater reliance on a system of accrual accounting that recognizes the future liabilities that arise out of today's actions. This change has been actively promoted as a tool for improved decision-making. In the calculation of profit from current operations, private firms have become increasingly aware of the importance of a full recognition of all the costs that arise from current operations including future pension payments. Similarly, State and local governments are concerned with the accurate assignment of the costs of their activities to current and future taxpayers. The result has been a focus on allocating funds to finance accrued liabilities.

In contrast, the discussion of budget policy at the national level is driven by a much different dynamic. One important distinction emerges from the use of fiscal policy to promote economic stabilization, actively seeking budget deficits during periods of recession. Believing that the cross-border leakages are very large, few states have ever attempted to adjust their own budget balances for stabilization purposes. A focus on the economy-wide economic effects of fiscal policy promotes the aggregation of the budget accounts into a single net measure of the cash flow balance. Thus, while the U.S. Congress has passed several bills aimed at separating the Social Security system from the "on-budget" accounts, those distinctions are ignored in most public discussions of the government's economic policies.

In a review of five recent national initiatives to establish or reform centralized pension funds, Palacios (2002) also stresses the importance of governance issues. The five countries in his sample were Canada, Ireland, Japan, New Zealand, and Sweden. Palacios pointed to the importance of independent management boards with responsibility for setting investment policy. The investment policy should recognize the importance of asset diversification, create measures

of performance based on accepted accounting standards, and establish benchmarks for evaluating performance. Finally, good governance requires a mechanism for regular public reporting and disclosure. Unlike private pension funds, the public systems are not subject to external supervision, and operate more as self-regulated monopolies. This makes public disclosure more critical.

Governments of the five countries believe that by adopting stronger governance procedures they can avoid the problems of past efforts to operate funded programs. However, the threat that pension surpluses will be dissipated arises from forces outside the pension fund system itself. Even a well-run pension system cannot prevent the legislature from subsuming the pension balance within its targets for fiscal policy. National governments appear to more myopic than the U.S. states in their decision making. Perhaps, they feel less constrained in their ability to raise future taxes in line with obligations, or they believe that those obligations are less binding.

Private-sector funding

A second approach to advance funding of future pension obligations would require the full or partial replacement of the public PAYGO system with a new funded private scheme. An example of this kind of reform is the proposal of the Bush Commission in the United States to redirect a percentage of current Social Security contributions into funded individual retirement accounts (President's Commission to Strengthen Social Security, 2002). However, this simple redirection of contributions will have little or no effect on aggregate national saving, since the surplus of the new private pension fund would be largely offset by an increased deficit in the public sector pension system. The first requirement for a net addition to saving is that the shift to

a funded system must produce a net increase in pension contributions out of current income or a net reduction in pension benefits to current beneficiaries. Furthermore, if pension reform is to add to national saving, it must involve some short-term sacrifice of public or private consumption. President Bush's reform commission did not propose a plan that would ensure one of these outcomes since it simply shifted funds from the government to private accounts.

An alternative type of reform is to introduce a new system of mandatory defined-contribution accounts as an addition to the existing system rather than as a partial substitute for that system. The issue we wish to address is the extent to which individuals would react to the new accounts by reducing their contributions to other retirement accounts or other household saving. Many workers in the lower ranks of the income distribution have little or no financial wealth and save very little. For these low-income workers there is little possibility that mandatory contributions to the new pension accounts would be offset by reductions in other forms of saving.[21] However, roughly 50 percent of U.S. workers currently participate in private, employer-sponsored pension plans. These workers include most people with large wealth holdings, and they account for an overwhelming percentage of total worker saving. For these individuals, the substitution possibilities are much greater. Mandatory contributions to new pension accounts can be easily offset by smaller contributions to old pension accounts.

Although a much smaller percentage of the active workforce is covered by funded, employer-sponsored pension plans in other OECD countries, household saving rates are typically higher elsewhere in the OECD than they are in the United States. Thus, there is wide scope for worker households to reduce other components of their saving if they are forced to contribute to new funded pension programs.

[21] According to the 2001 Survey of Consumer Finances, the median level of financial assets of families in the lower half of the income distribution was less than $10 thousand.

The saving implications of individual accounts and other forms of retirement saving have been explored in many U.S. and Canadian studies of household behavior. Much of this literature is concerned with the voluntary response of saving to changes in tax incentives, and many of its findings may not be applicable to analyzing the effects of a new mandatory pension program. The studies have also been largely based on microeconomic data obtained from household surveys, and agreement on the extent of substitution between retirement and non-retirement saving has foundered amidst problems of dealing the extreme heterogeneity of saving behavior at the level of individual households. Those households that took advantage of the tax-deferred accounts may simply have a greater affinity to save. The lack of a consensus is most striking in two recent surveys of the empirical studies. Poterba, Venti, and Wise (1998) argue that the inflow of funds to the new retirement accounts is largely net new saving, whereas Engen, Gale and Scholtz (1996) maintain that the dominant effect is one of substitution between new and old forms of saving.[22] We try to augment this literature by considering cross-national patterns of aggregate private saving.

The most commonly cited example of a shift to mandatory individual retirement accounts occurred in the early 1980s in Chile, which experienced a coincident and very large increase in private saving that has been attributed to the creation of the individual accounts (Holzmann, 1997, and Schmidt-Hebbel, 1998). However, Agosin (2002) extended their analysis and shows that the rise of saving was concentrated in the business sector, and that the net change in household saving was small.

Among the OECD countries, Great Britain has been most active in promoting a shift out of the public system in favor of funded private pensions. Granville and Mallick (2002) argue

[22] Also, see Gale (1998) and Gustman and Steinmeir (1999).

that the increase in occupational pension saving was totally offset by a decrease in other forms of household saving. Attanasio and Rohwedder (2003) reach a somewhat more positive conclusion using micro survey data from the Family Expenditure Survey. They find that the elasticity of substitution ranges from -0.65 for 43-53 year olds to -0.75 for 54-64 year olds.

Bailliu and Reisen (2000) report a weak positive correlation between the buildup of private pension assets relative to GDP and private saving for a sample consisting of six OECD and three non-OECD countries. However, the correlation was negative in a sample limited to the OECD countries. Samwick (2000) found a lower rate of saving in countries with extensive PAYGO systems, but he was unable to find consistent evidence of higher rates of saving after reform.

We use data from the national accounts and the flow of funds (financial) accounts to separate private saving into three components: corporate saving (retained earnings), saving within formal retirement accounts, and non-retirement saving. The measure of saving within the retirement accounts excludes capital gains and losses since they are not derived from current production. We are able to make these calculations for seven OECD countries over the period of 1970 to 2000. The results, expressed as a percent of national income, are show in figure 3.

There is substantial variation, across these countries in both the level of private saving and the relative importance of institutional forms of retirement saving.[23] Formal retirement saving accounts are small in Japan and Germany, but they are a primary component of private saving in the other five countries. Retirement saving is particularly large in the United States

[23] In general, retirement saving is defined as accumulation within life insurance and pension funds, but for the United States and Canada it also includes saving in individual retirement accounts (IRAs). Also the U.S. data is sufficient to allow us to exclude the non-pension fund investments within life insurance companies.

where it has come to dominate household saving.[24] At the same time, the United States has experienced a large reduction in the overall rate of private saving. If the growth of the pension accounts represented new saving, something of enormous significance has altered pre-existing patterns of saving. Furthermore, there are marked reductions in private saving rates in most of the countries, with much of the decline taking place in non-pension saving. In fact, non-pension household saving was negative in four of the countries by 2000.

We can obtain a crude measure of the relationship between overall private saving and the growth of pension and life insurance accounts by estimating the private-sector equivalent of equation 1:

(2) $$PS_{it} = \alpha_i + \gamma_i LIPF_{it} + \delta_i \Delta Y_{it} + \lambda t ,$$

where

PS_{it} = Private-sector saving rate of the *i*th country in year *t*;

LIPF = Net accumulation within life insurance and pension funds, Averaged over two years and scaled by national income; and

ΔY = Percentage change in real GDP.

Unlike the analysis of government saving, we do not directly compare retirement and nor-retirement saving, because our estimates of total private saving and accumulation in the retirement accounts come from separate data sources. The estimate of net accumulation within life insurance and pension funds is drawn from the flow-of-funds accounts, while total saving is from the national accounts. Thus, measurement error in the residual, non-retirement saving, would be inversely correlated with the error in the estimate of saving within the retirement

[24] This is an apparent contrast to Lusardi, Skinner, and Venti (2001) who argue that retirement saving accounts have not contributed to saving in recent years. Their constructed measures differ substantially from the measures of pension saving in the Flow of Funds Accounts, however, and they exclude some of the components.

accounts, biasing the estimate of the substitution between the two forms of saving. The problem is largely avoided by using the national accounts' measure of total private saving as the dependent variable. However, we now expect the coefficient on retirement account saving, γ, to vary between zero (complete substitution) and unity (no substitution).

The relationship includes a trend term, and country-specific measures of the unemployment rate and aged dependency (the ratio of the population over age 60 to the population aged 16-60) to capture some of the other influences on private saving. We have data for the seven countries shown in figure 3 plus a smaller number of years for Denmark, Italy, the Netherlands, and Sweden, yielding a total of 260 annual observations over the period from 1971 to 2000. As with government saving, we have included country fixed effects.

The basic results from this specification are reported in column (1) of table 4. The two-period sum of the coefficients on life insurance and pension fund saving is 0.123, suggesting a large degree of substitution between saving in funded retirement accounts and other forms of private saving.[25] The coefficient is different from unity (no substitution) at the 0.01 level of significance, and not significantly different from zero (complete substitution). In addition, there is evidence of strong cyclical influences on saving and a significant negative correlation with the rise in aged dependency. A correction for autocorrelation actually results in negative coefficients on the life insurance and pension saving terms, although the are not significantly different from zero. Thus, the international macroeconomic evidence suggests that contributions to formal pension accounts mainly represent a substitute for older forms of saving rather than a net addition to the total.

[25] Standard errors are shown in parentheses.

We undertook several tests for stability of the results shown in column (2). First, the sequential exclusion of each of the individual countries from the regress ion yielded a relatively narrow range of variation in the combined coefficient on LIPF, -0.27 (excluding France) to 0.05 (excluding Australia). However, changes in the estimation period have a greater impact. There is a strong positive association of between the inflow of funds into retirement accounts and total saving in the first part of the data period, but it vanishes with the inclusion of 1990s.

The reaction of overall private saving to saving within a voluntary employer-provided pension system does not necessarily provide a reliable guide to the response of household saving to a new system of mandatory private accounts, but it is useful in indicating that the potential for private saving substitution is likely to be large. Furthermore, the potential for substitution seems as large or larger than within the public sector, and both forms of a shift to a funded retirement system will face similar problems.

Conclusion

One justification for proposals to increase funding within public or private pension systems is that such a policy will produce an equivalent increase in national saving, reducing the burden placed on the future workers who must support the retired elderly. This paper has examined several sources of empirical evidence to determine whether this justification for advanced funding is valid. We sought to estimate the impact of increased pension funding on national saving, both in public budgets and in the private sector.

The first kind of evidence comes from the experience of U.S. state governments in managing their employee pension funds. The behavior of state governments is relevant to the question of whether it is possible to fund a pension system within the public sector. Our results

show a high degree of separation between asset accumulation in state employee pension funds and the operations of states' non-pension operating budgets. States that accumulate exceptionally large reserves within their pension funds do not act as though the funds are available to finance non-pension government operations or to provide short-term relief to state taxpayers.

On the other hand, an examination of the experience of *national*-level governments that have attempted to pre-fund a portion of their public pension liabilities shows a less favorable budgetary response to pension fund accumulation. A large portion of the accumulation within national social insurance systems is offset for the government sector as a whole by larger deficits in other budgetary accounts. On average, OECD countries have been able to save only a small portion of any funds accumulated within their social insurance systems in anticipation of large expected liabilities when a growing fraction of the national population is retired. Between 60 and 100 percent of the saving within pension funds is offset by reductions in government saving elsewhere in the public budget.

We argue that the contrasting results for U.S. states and OECD nation states can be traced to differences in the governance of the pension systems and the degree of effort that is made to separate the pension funding from other budget activities. More fundamentally, differences in legislator behavior at the sub-national and national level may be explained by state competition for low-cost credit and differences in the mobility of taxpayers in the two kinds of jurisdictions. U.S. taxpayers are free to move from one state to another, and they may exit those states where high public borrowing costs or pension under-funding makes it exceptionally costly to pay for public infrastructure and the current flow of state-provided services. At the level of the nation state, there is much less competitive pressure to retain tax-paying residents, since it is much

harder for taxpayers to move from one country to another. Thus, state governments within the United States are pushed toward a conservative strategy in treating pension fund accumulations. They act as though such accumulations are not available for current spending on other government activities. In contrast, many national governments in the OECD treat pension accumulations as a potential source of funds for non-pension activities.

We also examined saving responses within the private sector to fluctuations in private insurance and pension fund accumulation. We found substantial evidence that pension saving substitutes for other forms private saving. While the experience with voluntary private pension programs is not identical to the situation that would arise under a system of mandatory pension accounts, it does indicate that the potential for asset substitution is a significant problem that would limit the impact of pension funding on aggregate private saving.

Overall, our results and those of other researches suggest that a concern with the potential for subsititution among alternative forms of saving, both public and private, should be a critical concern for any pension reform plan that is motivated by a desire to influence aggregate rates of saving and wealth accumulation.

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Table 1. Public Pension and Non-Pension Saving, Fixed Effects Estimates

	US States				
	Non-Retirement Budget Balance / Income			Non-Retirement Government Saving / Income[a]	
Independent Variable	(1)	(2)	(3)	(4)	(5)
Pension Saving[b]	-0.052 (0.041)	-0.070 (0.046)	-0.054 (0.040)	-0.058 (0.046)	-0.032 (0.038)
Lagged Pension Saving	-0.026 (0.043)	-0.047 (0.049)	-0.018 (0.043)	-0.059 (0.048)	-0.009 (0.041)
Income Change[c]	0.069 (0.009)	0.075 (0.010)	0.045 (0.009)	0.062 (0.010)	0.033 (0.009)
Lagged Income Change	0.034 (0.009)	0.036 (0.010)	0.028 (0.009)	0.030 (0.010)	0.018 (0.009)
Trend	[d]	[d]	[d]	[d]	[d]
Lagged Interest Rate		0.003 (0.001)	0.002 (0.002)	-0.002 (0.001)	-0.002 (0.002)
Adj. R^2	0.39	0.40	0.50	0.61	0.70
SSE	0.53	0.56	0.51	0.55	0.48
Autoregressive Correction	No	No	Rho = 0.44	No	Rho = 0.51
Period	1978-1999	1978-1999	1978-1999	1978-1999	1978-1999
NOBS	1034	836	836	836	836

Note: Standard errors in parentheses. First column regression excludes Alaska, Vermont, and Wyoming.

[a] Non-retirement saving equals the state non-retirement budget balance plus total capital outlays.

[b] Pension saving is the current balance of the state-level employee retirement pension funds, scaled by state personal income.

[c] Income change at the state level is the change in personal income deflated by the national GDP price deflator.

[d] The trend is represented by a set of annual categorical variables.

Table 2. US Public Pension and Non-Pension Saving

	Dependent Variable: On-Budget Surplus				
Independent Variable	(1)	(2)	(3)	(4)	(5)
Social Security Surplus	0.83	0.98	-1.43	-1.33	-3.15
	(1.31)	(1.60)	(1.37)	(1.43)	(1.24)
Income Change[a]	0.50	0.26	0.22	-0.02	-0.04
	(0.17)	(0.12)	(0.17)	(0.11)	(0.09)
Unemployment Rate			-0.89	-1.08	-0.99
			(0.32)	(0.30)	(0.26)
Trend	0.33	0.21	0.28	0.12	0.25
	(0.11)	(0.15)	(0.09)	(0.14)	(0.12)
Constant	-661.0	-433.9	-560.7	-238.4	-500.7
	(210.6)	(303.5)	(180.4)	(281.2)	(257.6)
Adj. R^2	0.74	0.79	0.82	0.86	0.90
SSE	1.07	0.97	0.90	0.80	0.78
Autoregressive Correction	No	Rho = 0.63	No	Rho = 0.72	Rho = 0.90
Period	1983-2002	1983-2002	1983-2002	1983-2002	1979-2000
NOBS	20	20	20	20	22

Note: Budget variables are measured as a percent of GDP. Standard errors in parentheses.

[a] Income change is the annual percent change in GDP.

Table 3. International Public Pension and Non-Pension Saving, Fixed Effects Estimates

	Non-Retirement Government Saving / National Income		
Independent Variable	Full Sample	Full Sample	Small Sample
Pension Saving[a]	-0.37	-0.40	-0.59
	(0.26)	(0.15)	(0.22)
Lagged Pension Saving	-0.89	-0.17	-0.05
	(0.26)	(0.17)	(0.29)
Income Change[b]	0.65	0.49	0.51
	(0.11)	(0.10)	(0.15)
Trend	0.07	0.09	0.14
	(0.02)	(0.04)	(0.06)
Unemployment Rate	-0.79	-0.76	-1.14
	(0.07)	(0.09)	(0.14)
Adj. R^2	0.69	0.87	0.89
SSE	2.23	1.42	1.64
Autoregressive Correction	No	Rho = 0.81	Rho = 0.77
Period	1975-2000	1975-2000	1975-2000
NOBS	305	305	128

Note: Standard errors in parentheses. Small sample countries are Canada, Denmark, Finland, Japan, and Sweden.

[a] Pension saving in government saving regression is saving within the government social insurance account, scaled by national income.

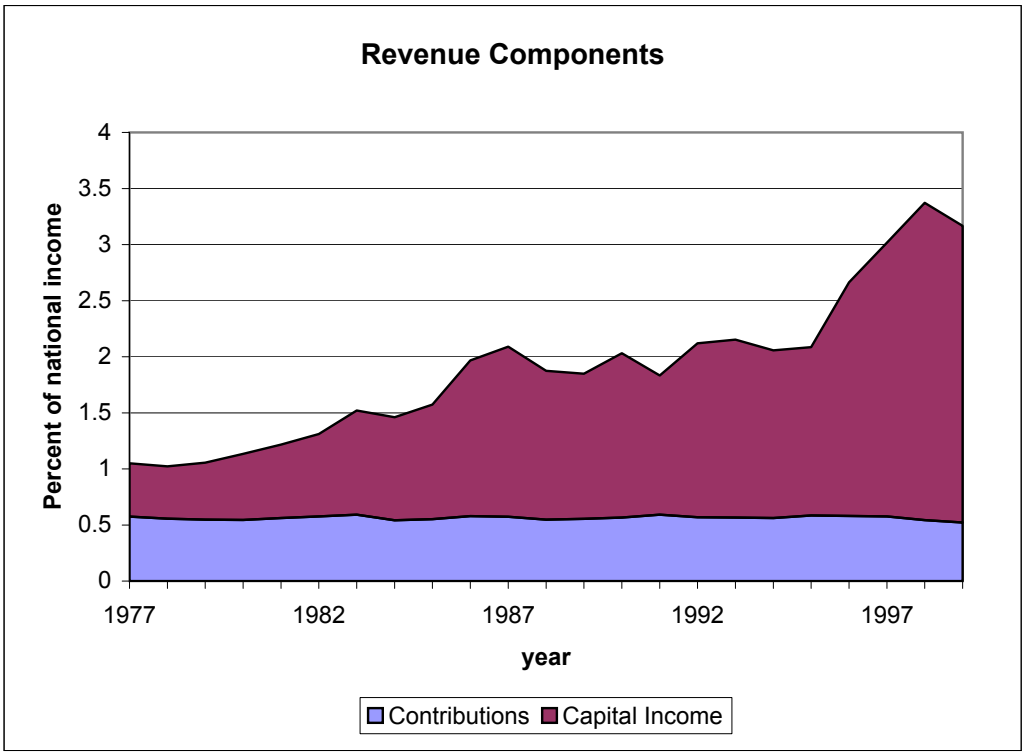
[b] Income change is the average percent change in real GDP over the current year and prior two years.

Table 4. Private Saving, Fixed Effects Estimates

Independent Variable	Private Saving / National Income (1)	(2)
Life Insurance and Pension Saving	-0.098 (0.21)	-0.089 (0.14)
Lagged Life Insurance and Pension Saving	0.221 (0.23)	-0.055 (0.15)
Change in Real GDP	0.105 (0.07)	0.130 (0.04)
Dependency Rate	-0.72 (0.095)	-0.58 (0.18)
Unemployment Rate	0.248 (0.068)	0.200 (0.089)
Trend	-0.150 (0.024)	-0.128 (0.044)
Adj. R^2	0.83	0.91
Autoregressive Correction	No	Rho = 0.75
SSE	1.92	1.41
Period	1971-2000	1971-2000
NOBS	260	260

Note: standard errors in parentheses.

Figure 1. Composition of State and Local Government Pension Income



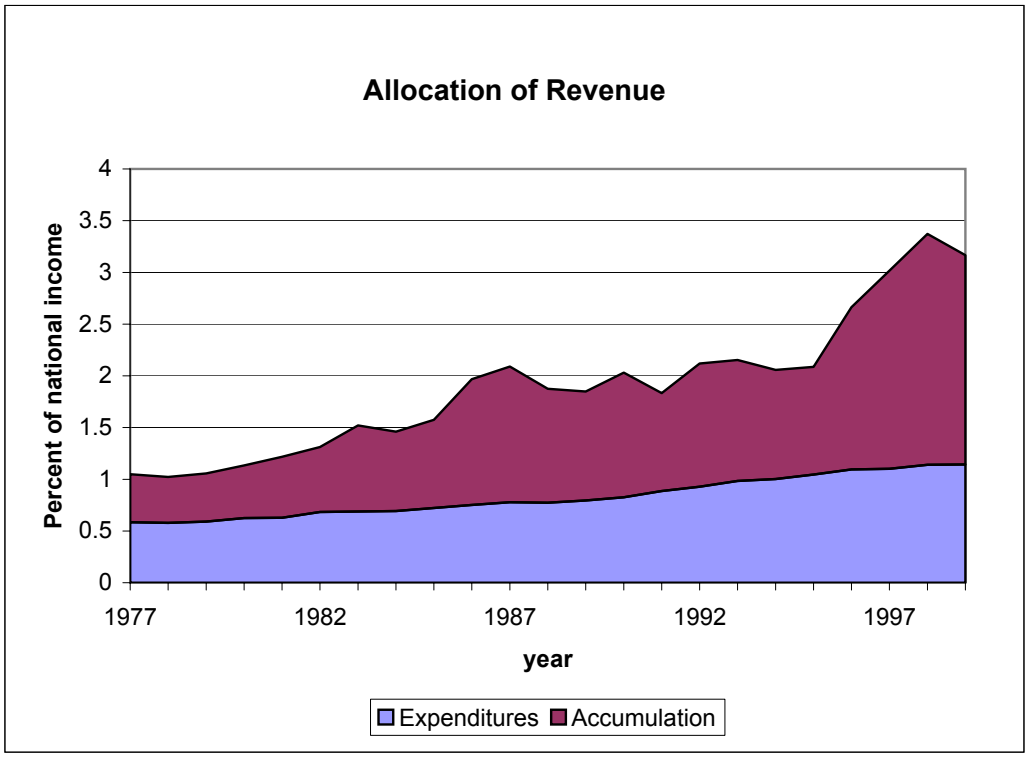
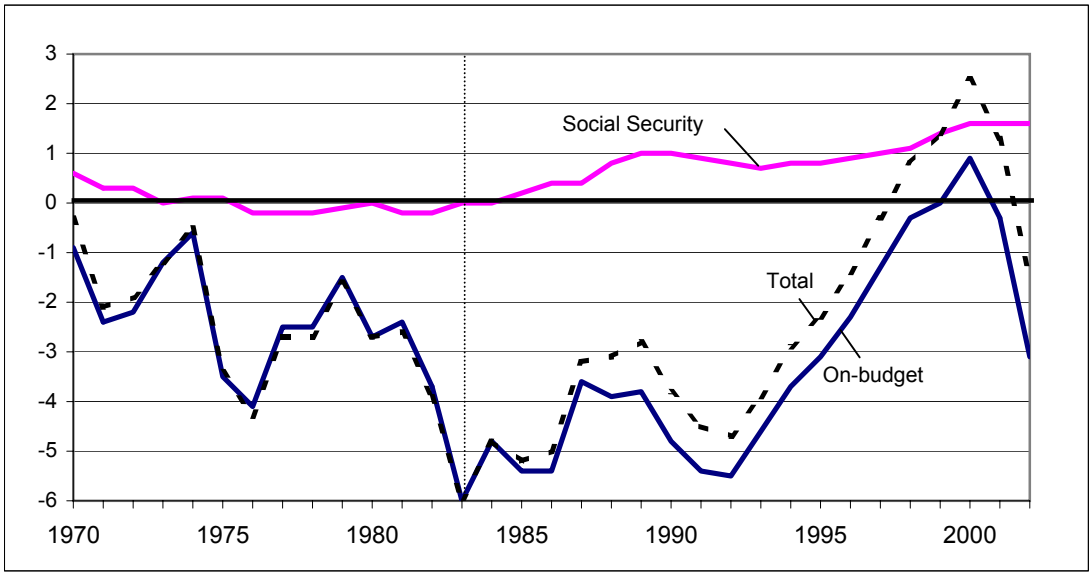


Figure 2. On-budget and Social Security Surpluses and Deficits, 1970-2002



Source: CBO: The Budget and Economic Outlook, January 2003.

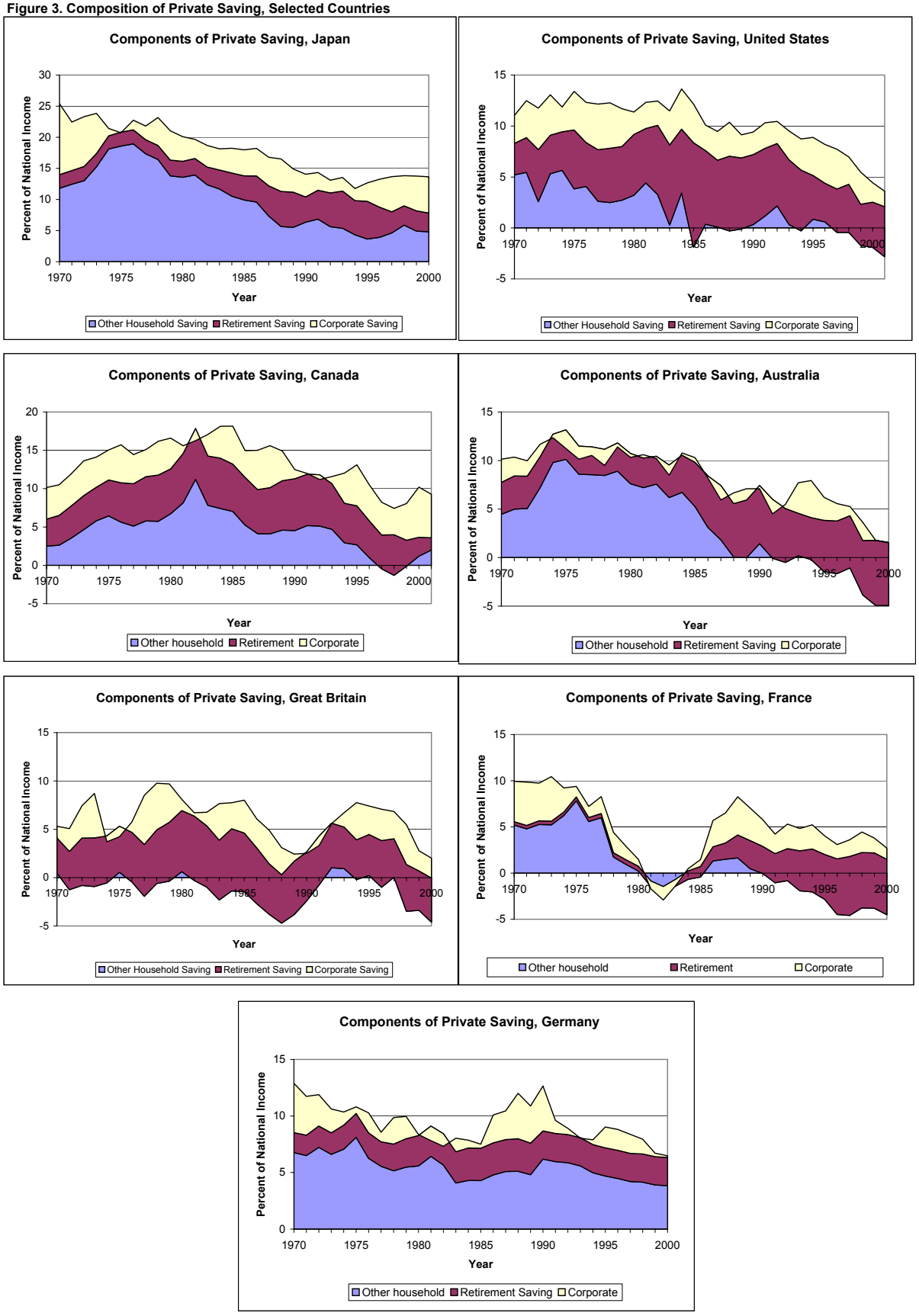



Figure 3. Composition of Private Saving, Selected Countries