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Time-Series Estimates of Pension Benefits by State 1967-2000

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Abstract

In this paper we describe, compare, and evaluate the available data for preparing time-series estimates of pension benefits by state and present a set of such estimates for the years 1967 to 2000. We conclude that the Current Population Survey is the best source on the basis of timeliness and the length of the time series it can support. This data source, a household survey, is unlike the typical "complete count" administrative records used in the State Personal Income Accounts yet we demonstrate that it provides a geographic distribution very similar to the traditional data sources. Finally we show that state shares of pension benefits exhibit very different trends and these trends oftentimes are the opposite of those exhibited by their shares of social security benefits.

Time-Series Estimates Of Pension Benefits By State

1967-2000

Labor compensation in the form of a pension is interesting to economists in part because there is a long interval between the time when future pension benefits are earned and when they are received. During this interval retirement migration can add an interesting regional twist to the study of pensions. The region in which a worker earns future pension benefits (and where the contributions to pension funds are recorded) is not necessarily the region in which the retiree receives those benefits. Although this may not matter much for most states, for a few popular retirement destinations, it can be extremely important.

At the national level, pensions are an important element in the compensation of workers, the savings of households, and the money income of retirees. Employer contributions to pension funds amounted to 4 percent of wage and salary disbursements in 2000, pension reserves amounted to 27 percent of household financial assets, and the benefits paid by pension funds ($463 billion) far exceeded the benefits paid by social security and other social insurance funds ($401 billion).

The adequacy of retirement income is of particular interest to policy makers as they consider major changes to the social security system. Because of the geographical pattern of retirement migration, the contemplated changes can have large regional consequences. It is therefore important to have accurate detailed data in order to evaluate alternative policies (Citro and Hanushek 1997).

State-level estimates of pension benefits are also potentially useful in studies of consumer behavior, forecasting sales for retailers, forecasting sales tax revenue for state

and local governments, estimating the local economic impact of retirement migration,[1] and ranking states according to their level of income.[2]

Some components of retirement income, in particular benefits paid by social security and pension benefits paid to retired government employees, currently are (or in the past have been) published in the Bureau of Economic Analysis's (BEA's) State Personal Income (SPI) accounts. However, pension benefits paid to private employees never have been measured or published.

In order to pay pension benefits to retirees, pension funds have accumulated large portfolios of financial and real assets. For some purposes it might be preferable to have regional estimates of pension wealth—of both workers and retirees—rather than just current benefits paid. However, as a practical matter, there are good regional data sources for benefits and very little information available on regional pension wealth.

In this paper we describe, compare, and evaluate the available data for preparing time-series estimates of pension benefits by state and present a set of such estimates for the years 1967 to 2000. First, we discuss the definition of and data sources for the national pension benefit estimates in the National Income and Product Accounts (NIPA). These will be the control total for our state estimates. Second, we critique four potential data sources for state-level estimates. Third, we compare how closely aggregate pensions from these alternative sources approach the national control total and compare the similarity of state pension shares computed from these sources with shares computed from various other time series. From this comparison we conclude that state shares based

[1] Empirical studies on the economic consequences of retirement migration such as Sastry (1992) and Shields, Stallman, and Deller (1999) have not examined important dynamic aspects of the matter because of a lack of time series data.

[2] State-level estimates are also extremely valuable even when one's concern is not with states *per se* but with national or international questions as Ram (1999) has illustrated.

on pension data collected by the Current Population Survey (CPS) are the best way to distribute our national control total for the purpose of preparing state-level pension estimates. The fourth section of the paper therefore discusses the CPS pension measure in detail, particularly with regard to its historical comparability. In section five, we present and discuss our estimates. Section six recapitulates our findings and makes suggestions for extensions and further research.

1. Pensions in the National Income and Product Accounts

BEA publishes a national estimate of benefits paid by pension and profit-sharing plans on Line 35 of Table 6.11 of the NIPA.[3] The private component of this estimate is prepared largely from a tabulation of Form 5500. This form is filed annually by pension and profit sharing plans with the Department of Labor. By itself, this form does not have information on the state of residence of pension beneficiaries.[4] The public component of the NIPA pension benefit estimate is prepared from various government reports. These reports were used in the past to prepare state-by-state estimates of government employee retirement and disability benefits when such benefits were treated as a transfer payment.[5]

Since most of the data used to prepare national estimates cannot support state estimates as well, it is necessary to use alternative data sources for state estimates. There is less information available at the state level and the quality of the information which is available tends to be lower than the sources used for national estimates. Therefore, we

[3] Old but still useful discussions of the issues involved in treating and measuring pension funds in the National Income and Product Accounts can be found in Holloway (1989) and Park (1992).

[4] See Lane (2002) for interesting work linking data from Form 5500 with data from the Longitudinal Employer Household Dynamics database by employer identification number to obtain state level data.

[5] Prior to the 1999 benchmark revision of the NIPA, government employee pensions were counted as part of personal income when they were received rather than when they were earned. Thus government employee retirement and disability benefits were treated as a transfer from the government to the household sector. In contrast, private employee pensions were counted as part of other labor income when they were earned. Currently, government and private employee pensions are treated alike and counted as personal income when they are earned.

propose to develop estimates of state *shares* of aggregate pension benefits and then multiply the NIPA estimate by these shares to obtain state *levels*. This can be thought of as a "top-down" approach.

There are a number of advantages to using the NIPA pension benefit estimate as a control for state-level estimates. However, the NIPA pension definition is not necessarily the best one for all of the studies listed in the introduction. One problem with the NIPA definition is that it includes distributions from a pension fund (lump sums) which participants roll over into IRAs.[6] Clearly this is not going into the same mental account as the monthly pension check that households treat as spendable money. It is also important to recognize that the NIPA definition excludes benefits paid from funds set up by and for the benefit of proprietors.

2. Alternative Sources of State Pension Estimates

There are four major data sources for state pension estimates: (1) Census of Population, (2) Compliance Research Information System (CRIS) matched individual income tax and information returns, (3) Statistics of Income (SOI) individual income tax returns, and (4) Current Population Survey (CPS) March Supplement.

Census of Population. The long-form questionnaires from the 1990 and 2000 Censuses asked for the amount of income received in the prior year as "retirement, survivor, or disability pensions" and explicitly instructed respondents not to include social security payments. No mention was made of life insurance, annuities, or IRAs, types of income that are sometimes combined with pensions in other data sources (e.g. CRIS and CPS). Questionnaires in prior censuses asked for pensions together with

[6] Sabelhaus and Weiner (1999 p.595) state that 1/2 to 2/3 of lump sum payments are rolled over.

additional types of income and are therefore not comparable with 1990 and 2000.[7] A major advantage of this data source is the large sample size permitting very precise estimates for even the smallest states. A disadvantage (shared by CRIS, SOI, and CPS) is that it does not distinguish pensions received by retired wage and salary workers from pensions received by retired proprietors.

Most pension funds are required to file the information return Form 1099-R with the IRS to report pension benefits paid. Information returns are not regularly tabulated by state; however, in 1999 some data from Form 1099-R were tabulated by state in the **Compliance Research Information System (CRIS)**. The CRIS tabulations omit two main categories of pensions: (1) pensions received by nonfilers and (2) nonqualified pensions. The latter are received by highly compensated employees and could be estimated by a careful tabulation of Form W-2, but that has not been done yet. The former are excluded from the CRIS database because it was designed to match a sample of tax returns with information returns rather than vice versa (almost 7 million returns were included in the sample). Therefore only those Form 1099-R information returns which could be matched with an income tax return were selected. (CRIS includes data from Forms 1040, 1099-R, and 5498.)

[7] In 1990 and 2000 the census asked for retirement, survivor, or disability pensions, excluding social security. In 1980 the census asked for unemployment compensation, veterans' payments, pensions, alimony or child support, or any other sources of income received regularly—excluding lump-sum payments such as money from an inheritance or the sale of a home. In 1970 the census asked for interest, dividends, veterans' payments, pensions, and other regular payments. In 1960 the census asked for social security, pensions, veteran's payments, rent (minus expenses), interest or dividends, unemployment insurance, welfare payments, and any other source not already entered. In 1950 income other than earnings was requested. The introduction to the 1950 Census explained that 3 categories of income were directly requested. Income other than earnings "includes money income received from sources other than wages or salary [a category requested directly] and self-employment [the other directly requested category] such as net income (or loss) from rents or receipts from roomers or boarders; royalties; interest, dividends, and periodic income from estates and trust funds; pensions; veterans' payments, armed forces allotments for dependents, and other governmental payments or assistance; and other income such as contributions for support from persons who are not members of the household, alimony, and periodic receipts from insurance policies or annuities."

Form 1099-R is a nearly comprehensive source on pension benefits, but there are some extraneous distributions reported on the form. Most of the distributions from IRAs, life insurance contracts, and annuities reported on the form do not fit the NIPA definition of pension benefits. The raw data of Form 1099-R could in principle be tabulated to provide a very high-quality time series of pensions by state, but (1) so far only one year of data have been released and (2) the CRIS data which have been released is a very simple summation ignoring all of the codes on the form which could be used to exclude nonpension items.

CRIS can support two alternative pension measures: (1) total distributions reported on Form 1099-R and (2) taxable pensions and annuities reported on Form 1040 plus nontaxable rollovers reported on Form 5498. Since all distributions from qualified pensions are reported on Form 1099-R, not just taxable distributions it is the most comprehensive data source. It includes lump-sum distributions whether rolled over or not. Information returns like 1099-R tend to be very accurate (unlike household surveys, information returns are not subject to faulty human recall). However frequent tax law changes can severely affect the usefulness of tax and information returns for time-series purposes (this also applies to the SOI data discussed next).

The alternative pension measure (taxable pensions plus nontaxable rollovers) is attractive because it excludes (1) all distributions from IRAs, (2) corrective distributions of excess salary deferrals or excess contributions to pension funds, (3) nontaxable distributions representing the beneficiary's investment in an annuity, etc. These items are counted in the total distributions measure but are outside the NIPA pension definition. A disadvantage of the alternative pension measure is that it excludes some nontaxable

pensions that are consistent with the NIPA pension definition, particularly nontaxable lump-sum pension distributions which are rolled over into another qualified pension plan. This exclusion is minimized to a large extent since the CRIS database has a tabulation of lump sums rolled over into IRAs (as reported on Form 5498).

Taxable pensions and annuities as reported on Form 1040 are also obtainable from **Statistics of Income (SOI)** published by the Internal Revenue Service (IRS). The comments above about the types of pensions reported on Form 1040 apply to taxable pensions from the SOI. SOI has two advantages over CRIS. First, SOI taxable pensions and annuities tabulated by state have been published annually since 1989. Second, unlike CRIS which is based on a sample, the SOI is a complete tabulation of all tax returns.

The **Current Population Survey's (CPS)** Annual Demographic File is the longest-running source of state-level pension income. With some diligence it is possible to assemble annual state-level pension estimates from 1967 to the present. The basic CPS (a monthly household survey designed to estimate the unemployment rate, among other things) is supplemented with a set of questions each March designed to measure money income. Money income by definition includes benefits paid by pension funds. The data are very timely—the 2002 public-use data file (having pensions received during calendar year 2001) was published on the internet by the fall of 2002.

Although the long-form questionnaire of the Census of Population also asks a (small) set of questions to measure money income, the CPS asks a battery of very detailed questions to carefully distinguish between types of income and to exhaustively account for every source. The survey is a much smaller program than the census, employs highly trained, experienced interviewers, and has a very high response rate. It is

noteworthy that interviewers may prompt respondents to use Form 1099-R as an aid in responding to pension questions.

The Survey is designed to exclude pensions received as lump sums and therefore excludes what has become a very large proportion of pension benefits (Sabelhaus and Weiner 1999 estimated that lump-sum pension distributions were $87.2 billion or 25% of all distributions reported on Form 1099-R in 1995). The CPS differs from the Census of Population by explicitly combining annuities with pensions. Roemer (2000) carefully assessed the quality of the components of money income from the CPS by comparing them to similar components of personal income in the NIPA (and other data sources).

3. Comparison of the Alternative Sources at the National Level

We compare aggregate (national) estimates of pension benefits from the four potential state-level data sources to the NIPA estimate in Table 1. The NIPA estimate of total pension benefits in 1999 is $424.6 billion. Using the CRIS database, total distributions reported on Form 1099-R—from pension funds, IRAs, life insurance contracts, and annuities—are far higher: $675.9 billion. On the other hand, the Census, SOI, and the CPS all fall short of the NIPA pension total. Of these four data sources, pensions from the Census are closest to the NIPA. Even so, it is 28% lower.

As noted above, the CRIS database supports two pension definitions. In addition to total pension distributions reported on Form 1099-R, it is possible to measure taxable pensions as reported on Form 1040 plus nontaxable rollovers from qualified pension plans to IRAs as reported on Form 5498. There are dangers in combining data from different tax forms in this manner. As Sabelhaus and Weiner (1999) have shown, not all pension distributions reported as taxable on Form 1099-R show up on Form 1040 and

some pension distributions reported on Form 1040 do not appear on Form 1099-R. Be that as it may, this estimate of total pensions, $496.4 billion, exceeds the NIPA estimate by about 17%. One reason it exceeds the NIPA estimate is that the NIPA excludes (and CRIS includes) pension distributions received from proprietors' funds.

We compare state shares of national pensions in Table 2. In Table 1 we could determine how closely the data sources came to our benchmark, pensions as reported in NIPA Table 6.11. Unfortunately, we have no benchmark by which to evaluate the state shares. All we can do is note that the choice of one data source rather than another can make a big difference in our state pension estimates.

We use two statistics to measure the similarity of state pension shares computed from different data sources. The first is the mean absolute log difference (MALD). In Table 2 the MALD for social security from BEA's Regional Economic Information System (REIS) and CPS retirement income is 0.23 which means that, the average state's share of social security benefits (averaging the fifty states with the District of Columbia and ignoring sign) is approximately 23% different than its share of pensions based on the CPS. At one extreme, Washington D.C.'s share of CPS retirement income (0.37%) is more than double its share of social security benefits (0.15%). This can be seen in Table 3. At the other extreme, South Dakota's pension share (0.16%) is substantially lower than its social security share (0.28%).

A 10% difference between the CPS retirement income and social security shares of a small state and a 10% difference in shares of a large state are given equal weight by the MALD statistic. An alternative statistic, the sum of absolute differences (SAD) gives more weight to large absolute (rather than percentage) differences in shares. When CPS

retirement income shares are compared with social security shares, the largest absolute difference (0.02) occurs in California (Table 3). The smallest discrepancy in shares (<0.005) occurs in Delaware. Summing over all states and Washington D.C., SAD equals 0.18. Since in Table 2 both statistics tell essentially the same story, we will discuss only MALD in this paper.

If state shares as given by CPS were the true state pension shares then we can see that state shares of social security benefits would not be a good distributor. Nor would population or wages and salaries be good distributors (MALD = 0.19 and 0.22 respectively). On the other hand, both Census retirement income and the SOI taxable pensions would be relatively good distributors (MALD = 0.10). The fact that state shares of pensions from the CPS and the Census are relatively similar is good news because the Census can support the development of pension estimates at the MSA and county levels.

We saw in Table 1 that aggregate CRIS taxable pensions plus rollovers came closer to the NIPA benchmark than any other pension series. We see in Table 2 that state shares based CRIS taxable pensions plus rollovers are somewhat different than state shares based on the CPS (MALD = 0.15). The dissimilarity is due more to the rollovers (MALD = 0.24) than to the taxable pensions (MALD = 0.11).

We compared the state shares of CRIS rollovers to REIS wages and salaries and computed MALD to be 0.13. Thus although wages and salaries are not a good distributor for taxable pension benefits (MALD = 0.22), wages are a decent distributor for rollovers.[8]

[8] Because rollovers have such a different state distribution than do taxable pensions, and because for some studies a pension measure which excludes rollovers is preferable to one including rollovers, it would be extremely valuable if BEA could develop a time series of rollovers (perhaps based on a special tabulation of Form 5498) as an addendum to the pension benefits reported in NIPA Table 6.11.

The fact that CPS retirement income, SOI taxable pensions, Census retirement income, and CRIS taxable pensions are very similar to each other means that it doesn't matter much which one is used for state shares. The choice between them must be made on some other basis. CRIS is available for a single year (1999), Census for two years (1980 and 1990), and SOI for eleven years (1989-99). The CPS, however, is available from 1967 to the present. Therefore in the rest of the paper we will focus on the CPS data.

4. Historical Comparability of the CPS

Over such a long time span it is not surprising that a number of changes in the CPS cause breaks in the historical comparability of the published data. In this section we will first describe the current survey and then the adjustments which are necessary to produce a consistent time series.

To the extent that highly compensated employees are included in the CPS sample, it ought to capture nonqualified pension benefits. On the other hand, the public-use data file "top-codes" some large responses to protect the confidentiality of the respondent, that is, amounts above a particular threshold are replaced with an average of all amounts above the threshold (from March 1999 to the present).[9] In the March 2001 survey, top codes for survivors' benefits, disability benefits, and pensions were $50,000, $35,000, and $45,000, respectively. In addition, before computer-assisted data collection was introduced with the March 1994 survey, benefits in a few cases may have exceeded the maximum amount that could be recorded on the paper questionnaire form. The forms

[9] If the replacement averages were computed state by state, this would not be a problem for state-level estimates. Note that for clarity, I use month and year to refer to the date the survey was conducted and year alone to refer to the period during which pension income was received. Thus the March 1999 Survey collected pension income for calendar year 1998. The calendar year will sometimes be referred to as the reference year.

used from March 1976-93 (there are no facsimiles of the questionnaire in the documentation for the earlier surveys) had a box in which the actual amount could be recorded but the 'bubbles' for computer scanning allowed a maximum of $99,999 to be recorded.

In the public-use data file the Census Bureau aggregates various pension-like sources of income into (a) survivors' benefits (b) disability benefits, and (c) ordinary pensions (Table 4).[10] We will define CPS retirement income as the sum of these three aggregates. It is clear from an inspection of Table 4 that some of the income types are not consistent with the NIPA pension definition. In particular, the NIPA treats railroad retirement, black lung miners' compensation, state temporary sickness (disability) insurance, and workers' compensation benefits as transfer payments (like social security). The NIPA excludes payments from estates, trusts, annuities, paid-up insurance policies, and accident insurance. Fortunately, the amounts at issue are small. Although the amounts of some items are suppressed because they were received by so few people, the amounts which are published total only $15.6 billion (or 6.4% of the $244.0 billion received as retirement income in 1999).[11]

[10] The documentation for the March 2001 Annual Demographic Supplement to the Current Population Survey is not clear about whether black lung benefits are in the income aggregate "Survivors' Benefits"—see the data dictionary item 61c. It is also unclear whether black lung and state temporary sickness insurance benefits are in the income aggregate "Disability Benefits"—see data dictionary item 64c. However, the Facsimile of the March Supplement Questionnaire specifically indicates these types of benefits are as described in Table C.

[11] Because some amounts are unknown, the other amounts are small, and there are few good state distributor series, we will not attempt to remove these extraneous types of income from CPS retirement income. The easiest type of income to remove is railroad retirement benefits, although even in this case the amount of disability benefits is unknown. A good state distributor is the railroad retirement transfer payments published in BEA's State Personal Income (SPI) accounts. These data can be used to prepare state shares to remove a portion of the CPS national estimate of railroad retirement benefits from the CPS state estimates of retirement income. Similarly, state shares of "other government retirement and disability insurance payments" from SPI could be used to remove a portion of the CPS national estimate of state temporary sickness insurance + black lung survivors' + black lung disability benefits from the CPS state estimates of retirement income. However, national estimates of those types of income were suppressed in

From March 1976 to March 1987, the pension income published in the public-use data file is defined as in Table 5. This definition is quite close to the NIPA pension definition. Notice in particular that railroad retirement is excluded. It would be desirable to remove annuities and insurance payments, but for the reasons given in footnote 8 will not attempt to do so. Table 5 also includes some other income aggregates published in the public-use data file so that one can see the complete relationship between the current and previous CPS pension aggregates.

Two public-use data files of the March 1988 survey were released. The original file is tabulated according to the income definitions given in Table 5. The rewrite file is tabulated according to the income definitions given in Table 4. The two files therefore provide a 'bridge' linking the current definitions with the previous definitions.

From March 1968 to March 1975 the Census Bureau combined income from government employees' pensions with veterans' payments, unemployment compensation, and workers' compensation. It combined income from private employees' pensions with

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1999 as noted in Table C. ("Other government retirement and disability insurance payments" also includes Pension Benefit Guaranty Corporation (PBGC) payments. PBGC benefits are embedded in the CPS pension aggregate. It is desirable to remove it but there is no way to identify it.)

The NIPA treats workers' compensation *from government funds* as a transfer payment. The CPS combines workers' compensation from private funds with that from government funds. Furthermore, the CPS separates workers' compensation into (1) payments people receive periodically for injuries they received at work, (2) payments people receive as a result of other health problems or disabilities, and (3) payments to survivors. Type 2 payments are aggregated with disability benefits in the public use file and Type 3 payments are aggregated with survivors' benefits. Because of the differences between the NIPA and CPS workers' compensation definitions, it is not clear that a better estimate of retirement income can be made by trying to remove workers' compensation from the CPS aggregates on the basis of the state distribution of workers' compensation in the SPI accounts.

Annuities and paid-up insurance policies are not payments from employment-related pension funds and so should be excluded. State-level estimates are published in Table 12.3 of the *Life Insurers' Fact Book 2000* published by the American Council of Life Insurers (ACLI). Although in principle this data could be used to generate state shares to remove a proportion of the national CPS aggregate of annuities and insurance payments from each state's retirement income estimate, the adjustment may introduce more error than it removes. This is because the national CPS aggregate of annuities and insurance in Table C is $4.3 billion while the national ACLI aggregate is $301 billion.

Lastly, although payments from accident insurance and estates and trusts are included in the CPS survivors' income (but are not payments from pension funds as defined by the NIPA), we are unaware of data which would permit us to remove it from state-level estimates.

alimony, child support and other minor income sources (Table 6). These extraneous types of income are about the same magnitude as pension income in 1977 (as can be verified from the data in Table 5). During this period (March 1968-75) the public-use data file has estimates for only a few individual states (from March 1976 to the present estimates are available for every state).

Prior to the March 1967 survey all types of income from Sources A-E were published as a single aggregate, even at the national level. The data for 1967 presented in Table 6 indicates that pensions are only about 26% of this aggregate. We know from the NIPA and SPI that the growth rates of the different types of income forming this aggregate vary substantially. Hence the earlier surveys are not very useful for measuring pension income.

5. Results

We tabulated retirement income from the Current Population Survey by state from March 1968 to March 2002 according to the methodology described in the appendix. The survey requests income from the previous year so the data refer to 1967-2001.

Figure 1 plots a simple tabulation of the raw CPS retirement income data against pension benefits from the NIPA, the series which is our national benchmark or control total. Two big shifts in the CPS data are obvious. The first occurs between 1974 and 1975, the second between 1986 and 1987. Up to 1975 CPS retirement income is greater than the NIPA benchmark because (as noted in the previous section) the raw CPS data include several other types of income in addition to pensions (Table 6). Pensions are only about 50% of the total amount.

Figure 2 plots the ratio of the NIPA data to the CPS data. Aside from the two shifts noted in Figure 1, the most notable features of this graph are the growing deviation of NIPA from CPS retirement income 1980-86 and 1993-2000. The widening gap since 1993 may be due to the growing importance of lump-sum pension payments which are included in the NIPA but excluded from the CPS. The cause of the earlier deviation is unknown. Aside from those periods, and making allowance for the 1974-75 and 1986-87 shifts, the two series are remarkably stable relative to each other.

Figure 3 plots population from CPS against REIS population for Nevada (a very rapidly growing state). REIS population is benchmarked to the Census. In Nevada's case it is clear that the CPS does a good job measuring population. It appears to be unbiased—sometimes above, sometimes below the revised figures based on the Census.[12]

The CPS includes a large number of households from each state. For instance, in the March 1977 survey the number of households ranged from 320 in the District of Columbia to 5,412 in California. However, although most households receive at least some income, not all households receive pension income. In fact, only about 10% of households reported any pension income. This reduces the effective number of households on which the pension estimates are based to as few as 30 (Delaware) and as many as 545 (California).

One consequence is that aggregate retirement income and share of national retirement income can be volatile from year to year. For instance, Nevada's share of the nation jumps from about 0.006 in 1996 to about 0.009 the next year. It then falls to about

[12] A full analysis of the accuracy of state population estimates from the CPS is beyond the scope of this paper. In general, the estimates are good; however, the peculiar case of Connecticut must be mentioned. The CPS population estimates for March 1968 to March 1972 range from 649,000 to 750,000 versus a REIS range of 2,964,000 to 3,070,000.

0.006 in 1998 and 1999 and jumps up to 0.009 in 2000. Nevada's aggregate pension income plummets from about $2.0 billion in 1997 to about $1.5 billion in 1998 and 1999 and then jumps to $2.2 billion in 2000 and falls to $1.6 billion in 2001 (Figure 4). In contrast the national aggregate rises continuously over this period except for a small 1% fall from 1999 to 2000 (Figure 1).

The variability of Nevada's retirement income increases substantially in the 1990s. We think this is due to two changes. First, the smoothness from 1967 to 1974 arises in part because the pensions were combined with other sources of income such as veterans' payments, workers' compensation, alimony, etc. which grow much more smoothly than pensions by themselves. Second, the Census Bureau introduced a new processing system in 1989 enabling them to distinguish more than 50 types of income rather than just 11. In the public-use data file, retirement income was disaggregated into survivors' benefits, disability benefits, and pensions. Instead of providing income for persons, income was provided for households and the top-code raised from $99,999 per person for aggregate retirement income to $3,899,961 per household for each of the three components of retirement income.[13] Since top-coding reduces variability, a relaxation of the top-coding constraints raises variability.

To reduce this variability the final step in our procedure for estimating state pension shares is to take a 3-year centered moving average.

In addition to sampling variability we took into account several changes which break the continuity of a time-series data developed from the survey.

[13] The March 1988 data file was rewritten using the new 1989 procedures.

1. Although weights assigned to respondents are revised after each census, previously published data files are generally not revised. This affects all years from March 1968 to the present.
2. In the March 1968 to March 1975 surveys, pension income is combined with veterans' payments, unemployment compensation, workers' compensation, alimony, child support and other minor income sources. From March 1976 to March 2002 these extraneous types of income are available separately.
3. Multi-state regions must be split into individual states in the March 1968 to March 1975 data files. Income is available for each state from March 1976 to the present.
4. New population weights based on the 1980 Census boosted national pension income by 2.7% over the estimate based on population weights from the 1970 census. At one extreme, Wisconsin's pension income was reduced 3.4%. At the other extreme, Nevada's pension income was raised 14.9%.
5. The new population controls introduced in March 1984 for Hispanic population had a negligible effect on national pension income but reduced pension income by as much as 1.5% in one state (Arizona) and boosted it by 5.6% in another state (North Dakota).
6. The estimate of pension income under the new processing methodology introduced with the March 1988 was 18% above the estimate using the old methodology. At the state level, revisions ranged from a 17% reduction for Vermont to a 56% increase for West Virginia.

After computing state shares of the nation we multiplied them by our national control total to obtain state-level pension benefits. Shares for each state are plotted in Figure 5, levels are plotted in Figure 6.

In Figure 5 our pension benefit estimates (derived from the CPS) are labeled 'CPS Pension' and benefits derived from the SOI are labeled 'SOI Pension.' For comparison, we also plot the state's share of social security benefits. The graphs illustrate two general findings:

1. Pension shares often have a different trend than social security shares
2. CPS pension shares are similar to SOI pension shares and both tend to be different from social security shares.

The graphs of several states are worth noting. Florida is a particularly interesting case because it is a popular retirement destination and because it has steadily increased its share of national population over the last three decades (from 3.2% in 1968 to 5.8% in 2001). Surprisingly, Florida's share of national pension benefits peaked in 1980 and since then has been trending down. Although the SOI data do not extend that far back, they have a slight downward trend too. In contrast, Florida's share of social security payments has an upward trend.

Nebraska is just the opposite of Florida. Its share of social security has a downward trend while its pension share is trending up, particularly 1967-89. There is not much trend in the short SOI series for Nebraska, but notice how close the shares of SOI and CPS are.

Nevada is a case in which both pension and social security shares are trending up. Lastly, Washington, D.C. is a case in which both shares are trending down. In all four of

these cases, the CPS and SOI pension shares are remarkably similar in magnitude and have the same trend. Furthermore, their trends and magnitudes are often quite different from social security. The fact that CPS, a sample, is so close to SOI, a complete count is strong evidence that the CPS has good state samples and that the top-down approach using shares of the nation is better than a bottom-up approach using dollar values.

Pension benefits measured in billions of dollars are plotted in Figure 6 along with social security benefits for comparison. Nebraska is a state in which pensions have always been less than social security benefits. Nevada and Washington, D.C. are just the opposite, pensions are much higher than social security. In Florida, pensions and social security are about the same magnitude. Alabama is an interesting case because there are distinct periods when pensions grew slower than social security (the gap between the two curves widens 1989-93) and periods when pensions grew faster (1993-97).

6. Recapitulation and Extensions

The basic conclusion of this study is that the CPS can yield very good estimates of pension benefits at the state level to complement the components of income in BEA's State Personal Income Accounts. Although the CPS is a household survey, an untraditional data source for the SPI accounts (which are typically based on complete count administrative records), it is timely, available for more than thirty years, and yields a geographic distribution very similar to the distribution from complete count data sources. It is possible to improve these estimates further, that is, make them more similar

to the NIPA pension benefit estimate, if a national control total of rollovers becomes available.[14]

State-level pension benefits are useful in themselves and also useful for improving estimates of other types of income in BEA's State Personal Income Accounts. For instance, the investment income of pension funds is a component of personal dividends, interest, and rent. Unfortunately, no good data on the geographic distribution of this income is available. Therefore BEA first allocates the income to active workers and retirees and then distributes the retirees' share using state shares of social security benefits. Our analysis suggests that pension benefits would be a better distributor.

The NIPA pension benefit time series begins in 1950 and it would be very desirable to extend state estimates back that far as well. As noted, state-level government employee pension benefits are available back to 1950 (albeit, reflecting the geography of the governmental unit paying the benefit rather than the current state of residence of the recipient). Unfortunately, we are unaware of any state-level private employee pension benefits data.

Benefits paid by pension funds are a natural complement to contributions made to pension funds, one of the components of BEA's personal income. Employer contributions to pension funds is part of other labor income (OLI) along with employer contributions to welfare funds (Table 7). It might be worth considering whether these other items should be counted as income when the benefit is paid rather than when the benefit is earned (i.e. when the employer makes the contribution). For workers' compensation and group health insurance, this may not make much difference since the

[14] It may be possible to develop state-level estimates of rollovers using the Survey of Employee Benefits supplement to the CPS. These supplements were conducted in May 1980, May 1983, May 1988, and April 1993. However, we have not examined them.

contributions tend to be similar in magnitude to the benefits paid in each period and from a regional perspective, the contributions and the benefits are probably made and received in the same region. For supplemental unemployment the timing of contributions and benefits can differ substantially in the temporal dimension, but in the regional dimension, the region in which the contributions and benefits occur is probably the same. Group life insurance is perhaps the component of OLI most like pensions in that the time and region of the employer contributions can differ substantially from the time and region in which benefits are received. However, the amounts are so small that it may not be worth the effort to collect the data.

Finally, benefits paid by pension funds will be useful for researchers interested in alternative definitions of income. Smeeding and Weinberg (2001) for instance suggest a definition of household income which counts pension benefits when received in contrast to the NIPA and SPI definitions which count them when earned.

Table 1. Aggregate Pension Estimates (sum of states), 1999, in billions dollars

Data Source	Amount
CRIS total distributions (Form 1099-R)	675.9
CRIS taxable pensions (Form 1040) + rollovers (Form 5498)	496.4
NIPA total pensions (Table 6.11, Line 35)	424.6
Census retirement income	306.8
SOI taxable pensions (Form 1040)	299.9
CPS retirement income	244.0

Note: Tabulations from the CRIS, SOI, CPS, and Census as reported in this table are the sum of states plus the District of Columbia. The CPS estimate is a simple weighted tabulation of the public-use data file without the adjustments described in the appendix.

Table 2. Similarity of state shares of various series to state shares of CPS retirement income, 1999

Series	MALD	SAD
REIS social security	0.23	0.18
REIS population	0.19	0.15
REIS wages and salaries	0.22	0.19
CRIS rollovers	0.24	0.19
CRIS taxable pensions	0.11	0.09
CRIS taxable pensions plus rollovers	0.15	0.12
SOI taxable pensions	0.10	0.09
Census retirement income	0.10	0.09

Table 3. Share of nation, select states, 1999

State	CPS Retirement Income	Social Security	Rollovers to IRAs
Alaska	0.0025	0.0011	0.0021
California	0.1145	0.0947	0.1164
Delaware	0.0031	0.0031	0.0035
D.C.	0.0037	0.0015	0.0014
Florida	0.0650	0.0720	0.0580
New Jersey	0.0310	0.0340	0.0470
South Dakota	0.0016	0.0028	0.0019
West Virginia	0.0084	0.0088	0.0037

Table 4. Composition of CPS Survivors', Disability, and Pension benefits in the March 1988 and later surveys. Aggregate amounts for reference year 1999 in billions of dollars

	Survivors' Benefits	Disability Benefits	Pensions
Company or union (incl. profit sharing)	8.7	4.8	94.8
Federal government (Civil service)	3.3	1.6	28.4
Military retirement	1.4	0.4	16.0
State or local government	2.2	3.3	45.9
Railroad retirement	0.6	B	3.6
Workers' compensation	B	0.8	NA
Black Lung miner's compensation	B	B	NA
Regular payments from estates or trusts	4.6	NA	NA
Annuities or paid-up insurance policies	1.8	NA	2.5
Accident insurance	NA	1.6	NA
State temporary sickness insurance	NA	B	NA
IRA, KEOGH, or 401(k)	NA	NA	5.8
Other or Don't Know	3.1	3.6	3.7
Total	26.4	16.7	200.9

NA—not applicable. This type of income is not part of the aggregate published in the public-use data file.

B—amount suppressed because this type of income was received by fewer than 75,000 persons out of a population of 196 million.

Source: Computed from data published in Table 12 of the Current Population Reports Series P-60 Number 209.

Table 5. Composition of CPS income aggregates in the March 1976-87 surveys. Aggregate amounts for reference year 1976 in billions of dollars.

Social security and railroad retirement income (I52A)	**$65.4**
Social security	
Railroad retirement survivor pensions	
Railroad retirement disability	
Railroad retirement	
Dividends, rentals, trust income (I53C)	**25.1**
Estates and trusts [survivor benefits]	
Estates and trusts	
Dividends	
Rent	
Veterans', unemployment, workman's compensation (I53D)	**20.8**
Unemployment compensation	
State workers' compensation, employers' insurance, or other	
Workers' compensation survivor pension	
Workers' compensation	
Veterans' survivor pension	
Veterans' disability	
Veterans' Administration payments	
GI Bill or VEAP	
Black lung survivor pension	
Black lung disability	
State temporary sickness	
Pension income (I53E)	**30.8**
Company or union survivor pension	
Company or union disability	
Company or union pension	
Federal government [survivor] pension	
Federal government disability	
Federal government retirement	
Military retirement [survivor] pension	
Military retirement disability	
Military retirement	
State or local government survivor pension	
State or local government disability	
State or local government pension	
Annuities or paid-up life insurance [survivor benefits]	
Annuities or paid-up life insurance	
Other retirement (incl. IRA or KEOGH)	

Table 5. Composition of CPS income aggregates in the March 1976-87 surveys. Aggregate amounts for reference year 1976 in billions of dollars—(continued).

Alimony, child support, and other income (I53F)	**9.8**
Own insurance	
Other survivor payments	
Accident or disability insurance	
Other disability payments	
Pell Grant or BEOG	
Other government educational assistance	
Scholarship or grant from school	
Other educational assistance	
Child support	
Alimony	
Financial assistance from outside household	

Source: Documentation for the 1987 Current Population Survey Annual Demographic File and the March 1977 public-use data file.
Spreadsheet: CPS Retirement Income.xls

Table 6. Composition of CPS Income Aggregates by Source in the March 1968-75 surveys. Aggregate amounts for reference year 1967 in billions of dollars

Source A	**$19.3**
Social security pensions, survivors' benefits, and permanent disability insurance payments	
Railroad retirement	
Source B	**17.5**
Dividends from stockholdings or membership in associations	
Interest on savings or bonds	
Periodic receipts from estates or trust funds	
Net income from rental of a house, store or other property to others	
Receipts from boarders or lodgers	
Source C	**3.7**
Old age assistance	
Aid to families with dependent children	
Aid to the blind or totally disabled	
Source D	**7.5**
Government employee pensions (fed, state, local, military)	
Unemployment compensation (public & private)	
Strike benefits	
Veterans' benefits	
Workmen's compensation (public & private)	
Source E	**6.7**
Company or Union pensions	
Annuities or insurance (periodic receipts)	
Alimony or child support	
Periodic contributions from persons not living in the household	
Net royalties	
Other (military family allotments, net gambling winnings, etc.)	

Note: Workmen's compensation is for injuries incurred at work. The cost of the insurance must have been paid by the employer.
Source: Documentation for the 1973-75 Current Population Survey Annual Demographic File and the March 1968 public-use data file.

Table 7. Components of Other Labor Income, US, 2001, billions of dollars

	Employer Contributions	Participants' Benefits
Pensions	186.7	494.8
Group Health	327.4	365.3
Group Life	12.3	17.5
Workers' Comp.	39.2	43.7
Suppl. Unemp.	1.9	1.8
Other	2.9	NA

Source: NIPA Table 6.11

Appendix. Detailed notes on adjusting pension data from the CPS public-use data files

We used the following procedures and the SAS, Excel, and AREMOS software packages to prepare our estimates of state-level pension benefits from the CPS public-use data files. Most of the following steps are programmed in the AREMOS file, cpspop.dat. (1) In 1971 there is a small amount of population and income not allocated to a particular state. We removed this from the national total. (2) We adjusted the 1967-74 income published as Source D + Source E to remove nonpension incomes.[15] We did this by aggregating various sources of income in 1976 (data for 1975 are not available for every state) to match as closely as possible those sources included in Sources D and E. We then calculated the ratio of pension income (I53E) to Sources D + E income. We assumed that the ratio was constant and multiplied aggregate Sources D+E income times the ratio. This was done for the US, each state for which data were available, and the multistate areas.[16] (3) We adjusted the data proportionately so that the states (and D.C.) summed to the national total. (4) We adjusted the raw CPS data 1976-present for errors in measuring population. We calculated the ratio of REIS population to CPS population and multiplied the raw CPS data by this ratio. We then summed the states to get the nation. Note well that in this step we used population from year t to adjust pensions in year t-1 because the CPS asks respondents about income in the prior year. We made the same adjustment to the raw CPS data 1967-75, although in this case the adjustment was made to multi-state regions and those individual states for which data were published.

[15] State shares of pension income are quite different from state shares of combined unemployment, veterans, alimony, and child support. Using data for 1976 we computed MALD to be 0.25 and SAD to be 0.21.

[16] Note well that the composition of the multi-state regions varies from survey to survey as do the states for which data are published.

(5) We calculated per capita pensions using the result of the previous step and REIS population. We assumed that per capita pensions in each of the states in a multi-state region grew at the same percentage rate. After calculating per capita pensions for these states we then multiplied their per capita pensions by REIS population to obtain aggregate pensions. We then adjusted aggregate pensions so that the sum of states equaled its corresponding multistate region. (6) We concatenated these intermediate pension estimates 1967-75 with our intermediate estimates 1976-2001. (7) We computed the ratio of the revised public-use data files to the original files for reference years 1979, 1983, and 1987. We then interpolated between the 1979 ratio and a value of 1.0 in 1973. and multiplied the intermediate pension estimates from step 6 for 1974-78 by this ratio. We then multiplied the data for 1967-82 by a constant equal to the 1983 ratio and finally multiplied the data for 1967-86 by a constant equal to the 1987 ratio. We summed the states to obtain a national total. (8) We then computed a state share of nation and a three-year centered moving average of the share. For 1967 we computed an average of 1967 and 1968. For 2000 we computed an average of 1999 and 2000. We multiplied the NIPA control total by this share to obtain the final estimate of the dollar value of pensions for each state 1967-2000.

Initially we obtained most of the CPS public-use data files from the National Bureau of Economic Research (NBER) website in November 2002. However, because of some difficulties we also obtained many of the data files from the Inter-University Consortium for Political and Social Research (ICPSR) website. Table 8 indicates the source of the data file we ultimately used. Note in particular, that for several years

(March 1980, 1984, and 1988) we used both the originally released CPS public-use data file and a revised file.

Table 8. Source of CPS public-use data files used in this study

Survey	NBER	ICPSR	Survey	NBER	ICPSR
March 1968	x	…	March 1985	x	…
March 1969	x	…	March 1986	x	…
March 1970	…	x	March 1987	x	…
March 1971	…	x	March 1988	…	x
March 1972	x	…	March 1988 rev	x	…
March 1973	x	…	March 1989	x	…
March 1974	x	…	March 1990	x	…
March 1975	…	x	March 1991	x	…
March 1976	…	x	March 1992	x	…
March 1977	x	…	March 1993	x	…
March 1978	x	…	March 1994	x	…
March 1979	…	x	March 1995	x	…
March 1980	x	…	March 1996	x	…
March 1980 rev	…	x	March 1997	x	…
March 1981	x	…	March 1998	x	…
March 1982	x	…	March 1999	x	…
March 1983	x	…	March 2000	x	…
March 1984	…	x	March 2001	x	…
March 1984 rev	…	x	March 2002	x	…

Some of the weights in the March 1968-75 surveys can be negative. The negative sign is sometimes preceded by zeroes, an unconventional format requiring special code to read. Instead, we simply edited the data files and repositioned the zeroes and signs so that SAS could read them conventionally. We verified that with this editing our weighted population totals matched those published in the documentation and that without this editing the totals did not match.[17]

The data file for the March 1970 (from the ICPSR) appears to have a problem with weights. We can match the unweighted population counts (total, civilian 14+, armed forces, and under 14) but not the weighted population count for civilian 14+. We suspect that when the ICPSR reformatted the data they made a mistake in handling the negative weights because of the odd way the Census Bureau formatted some of the numbers.

The documentation for the March 1975 survey from the ICPSR unfortunately does not have weighted population counts but the documentation from the NBER does. Unfortunately, our tabulation of the data file from ICPSR did not yield a population count that matched the count published in the NBER documentation. Furthermore, both the ICPSR and NBER data files appear to be missing 20 records.

[17] Unfortunately, the documentation for the March 1976 survey did not have a weighted population estimate for comparison purposes.

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Figure 1. Pension Benefits CPS vs. NIPA

(US, billions of dollars)

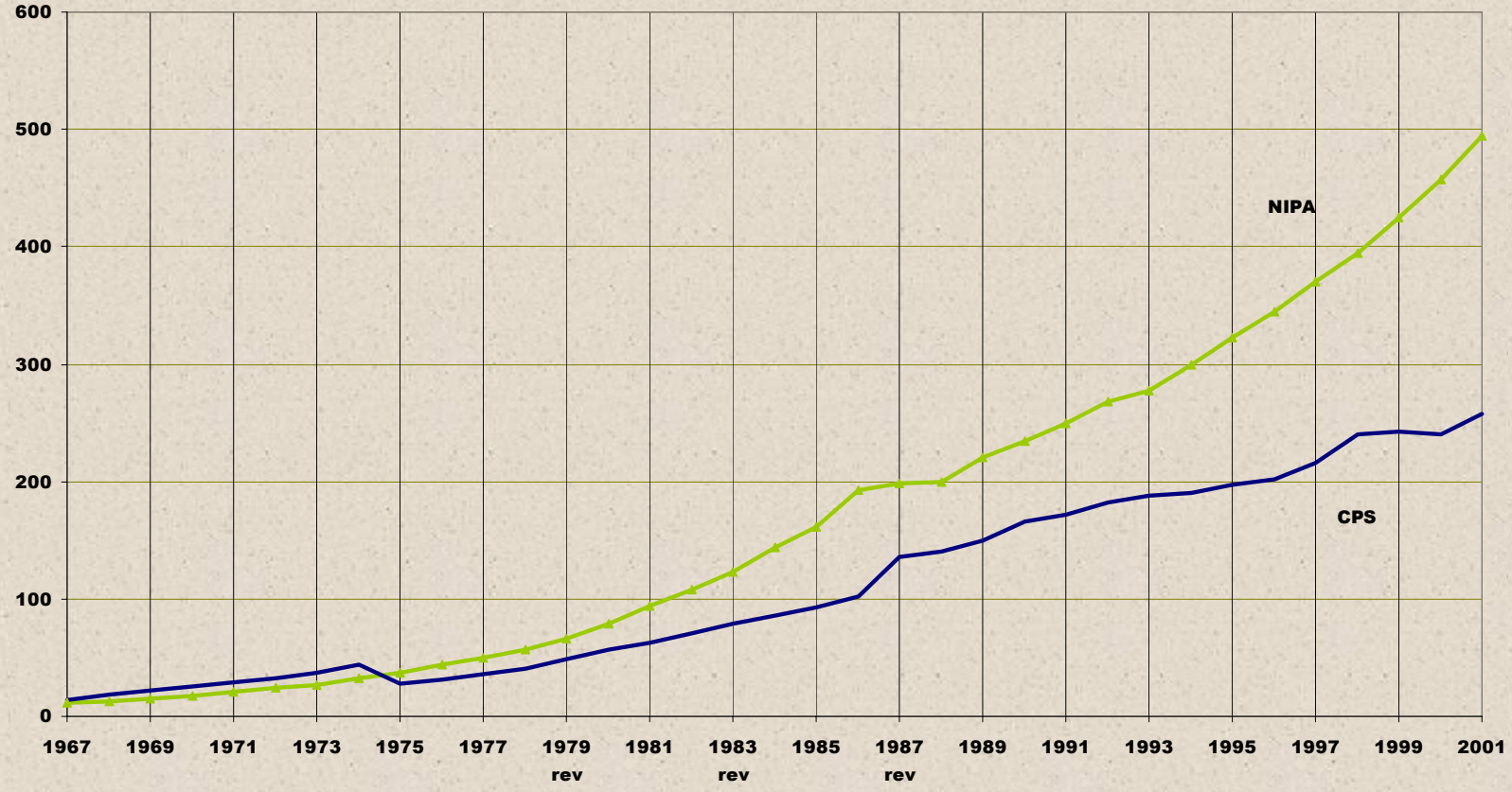


Figure 2. Ratio NIPA to CPS Retirement Income

(United States)

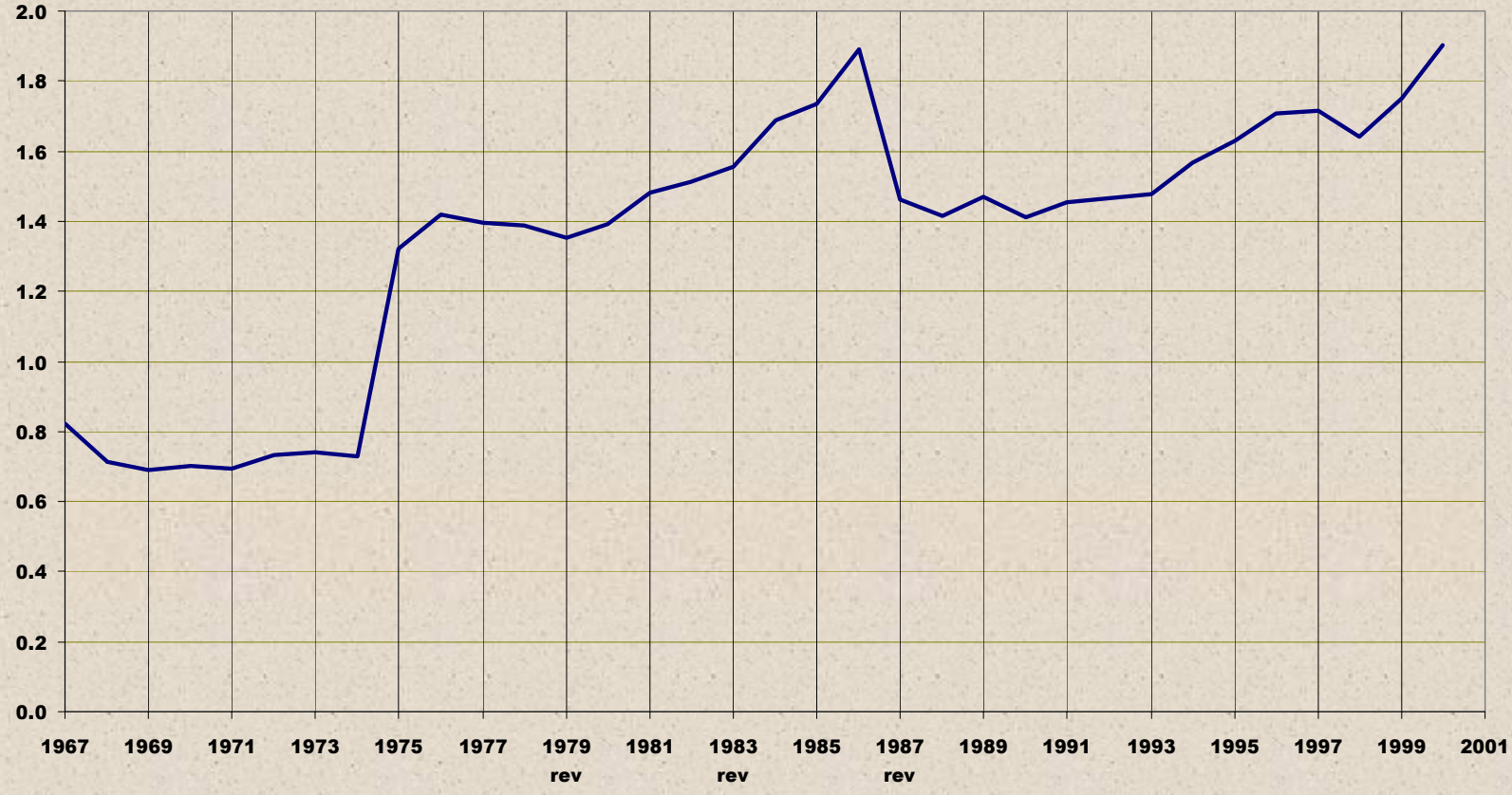


Figure 3. Population CPS vs. REIS

(Nevada, persons)

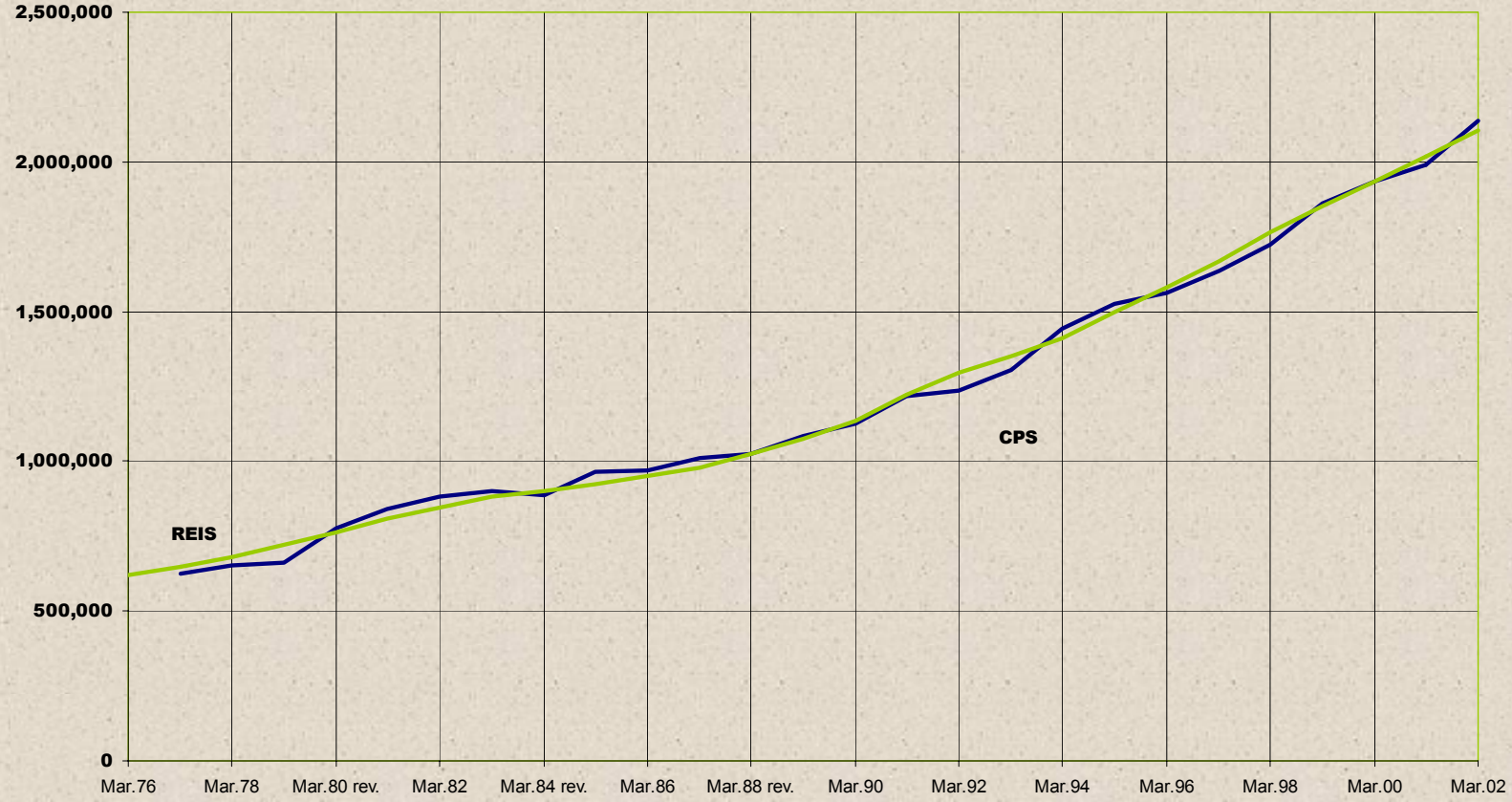


Figure 4. Raw CPS Pension

(Nevada, billions of dollars)

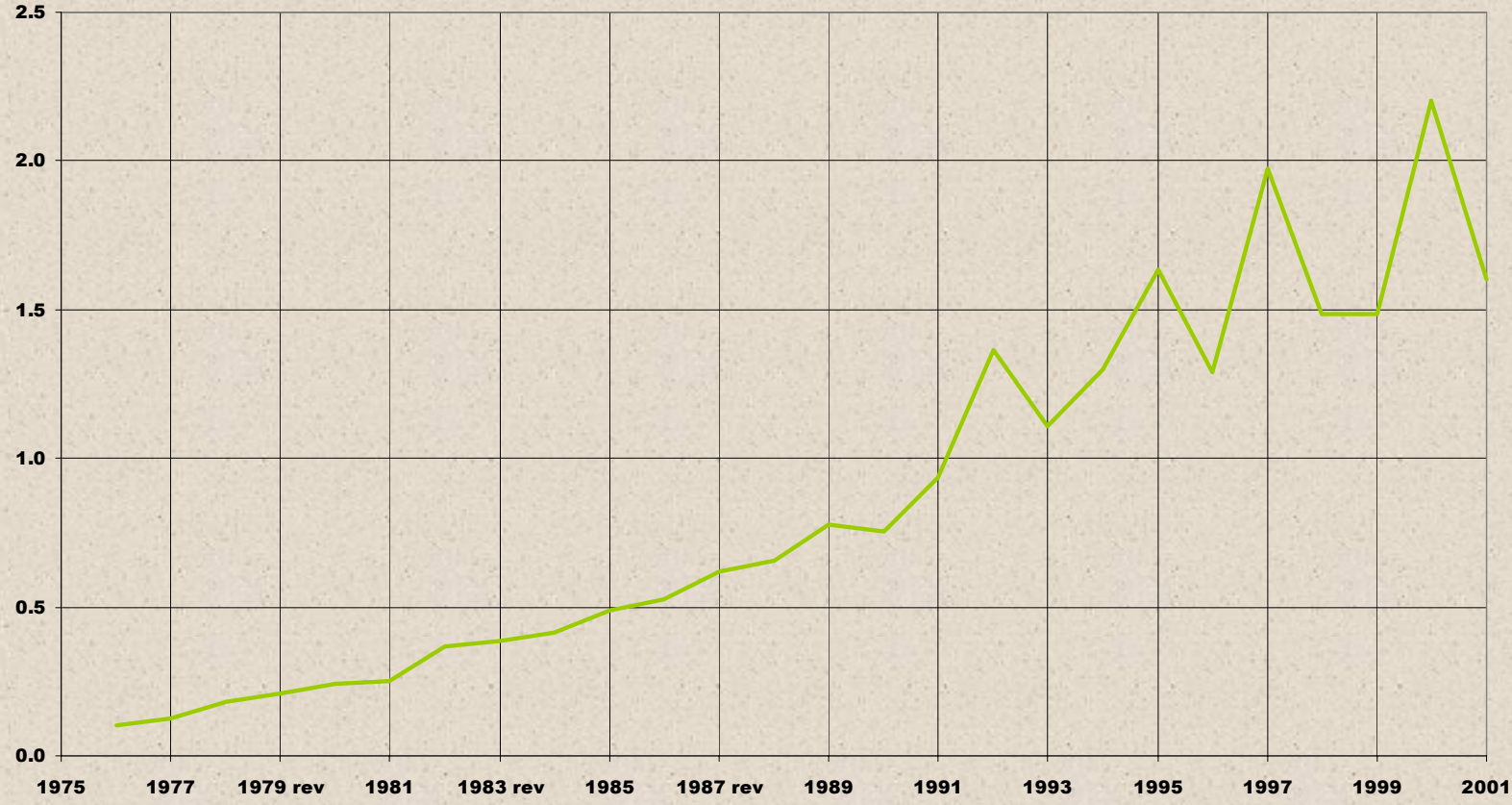
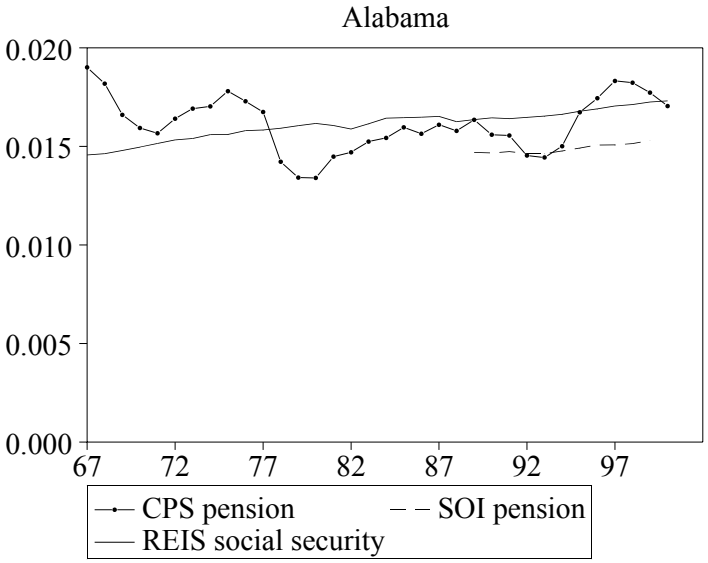
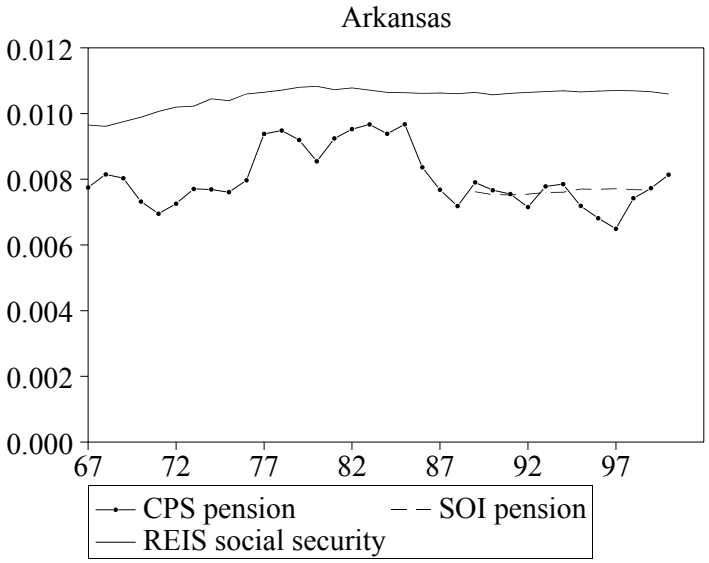
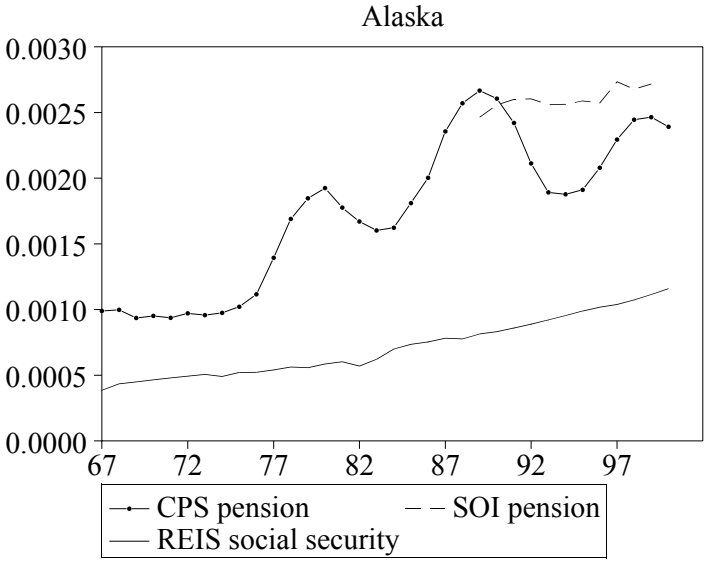
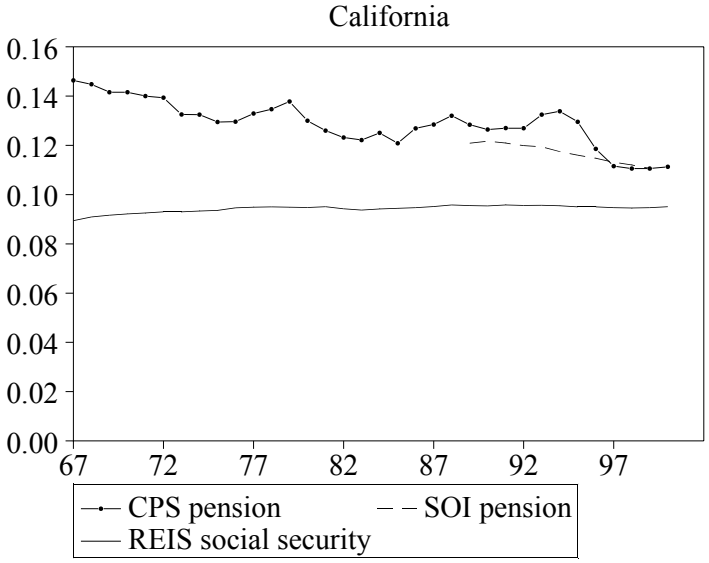


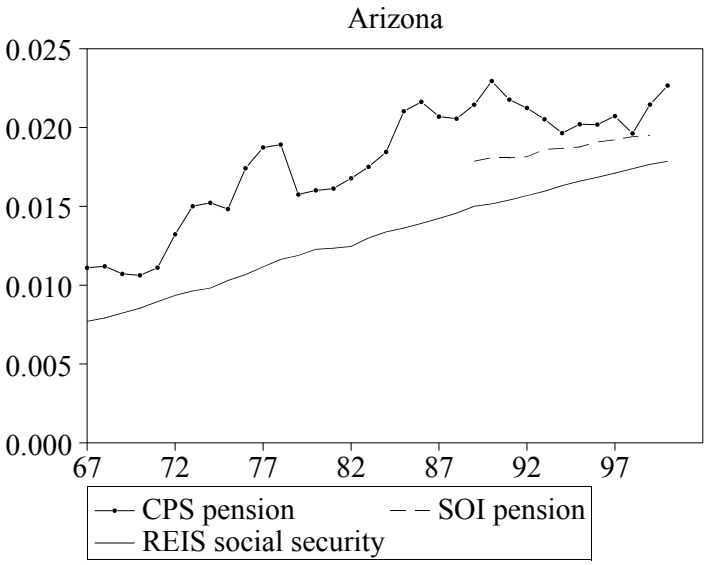
Figure 5. Share of nation

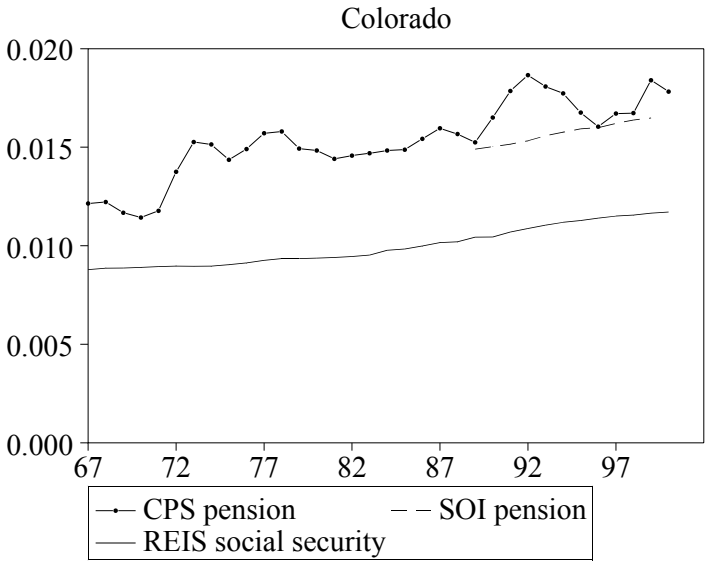












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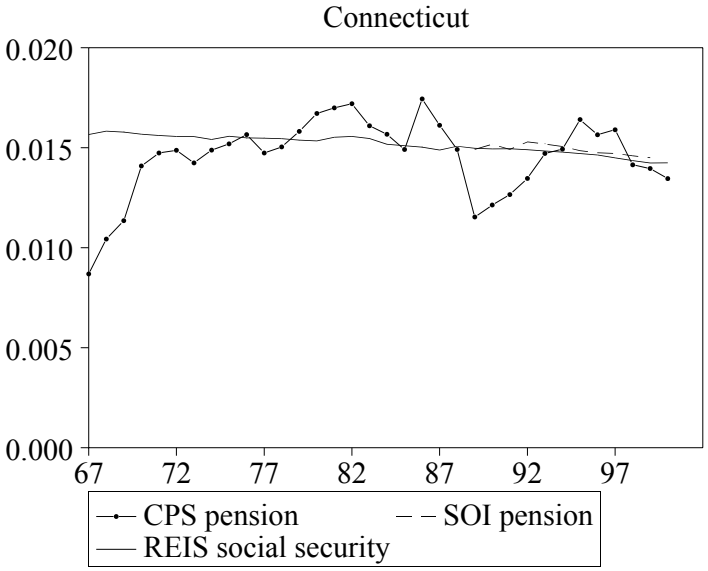

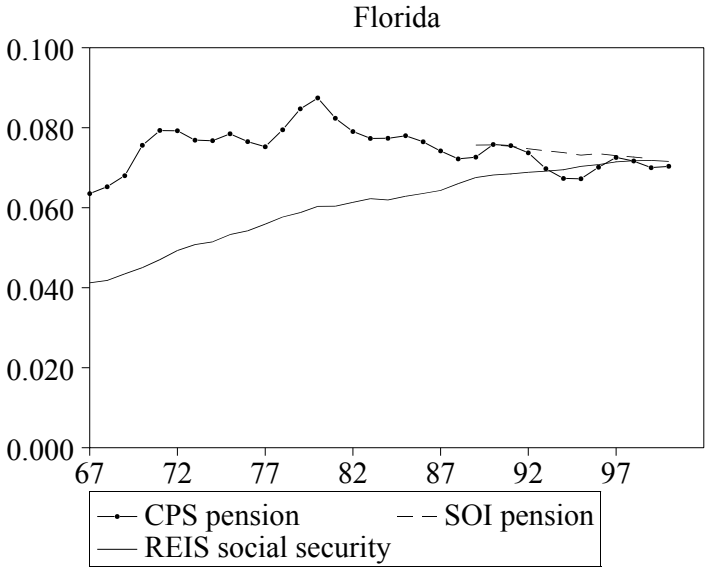

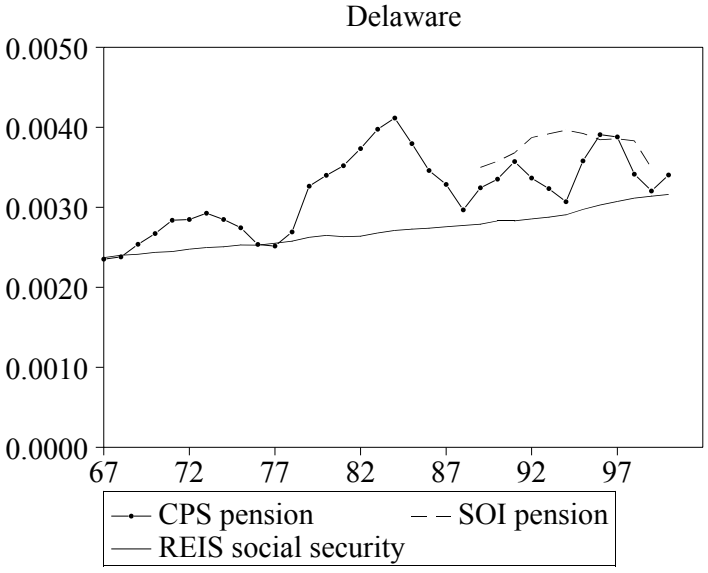

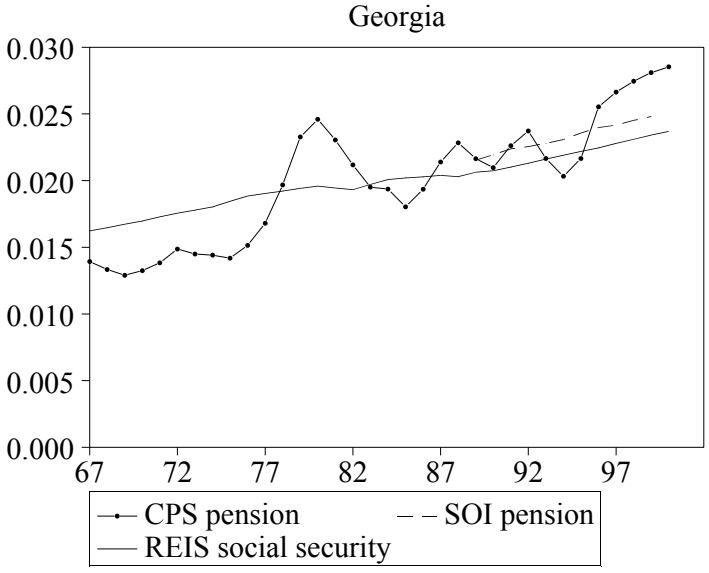

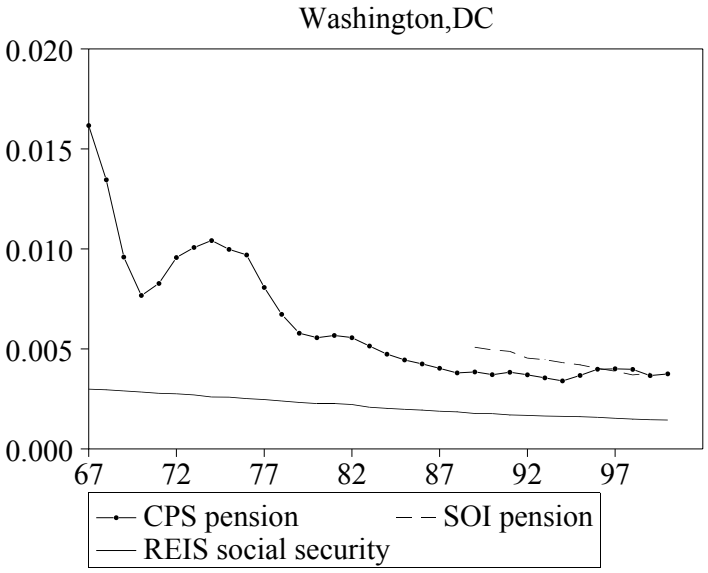

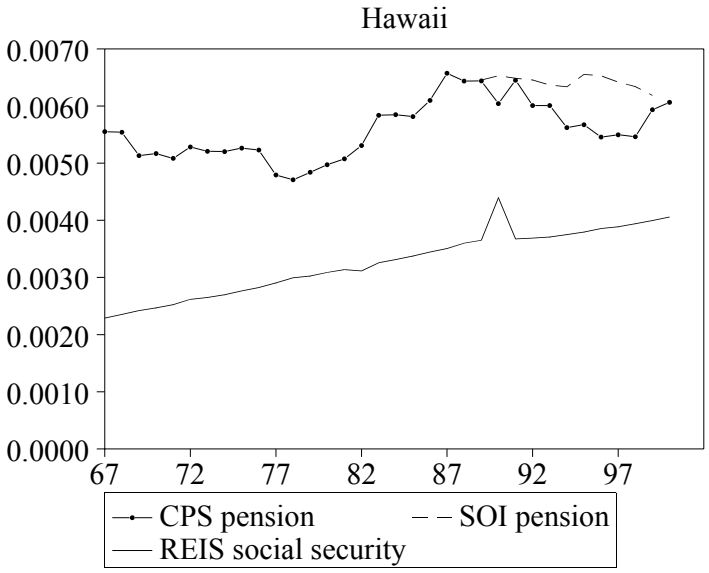

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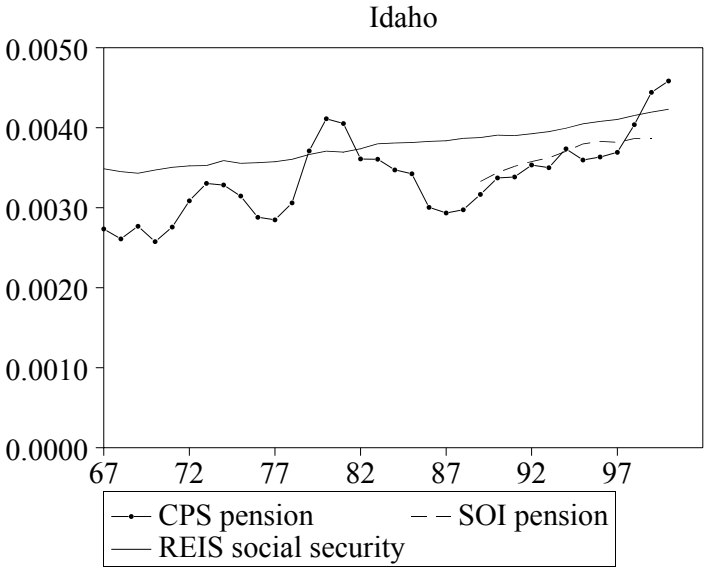

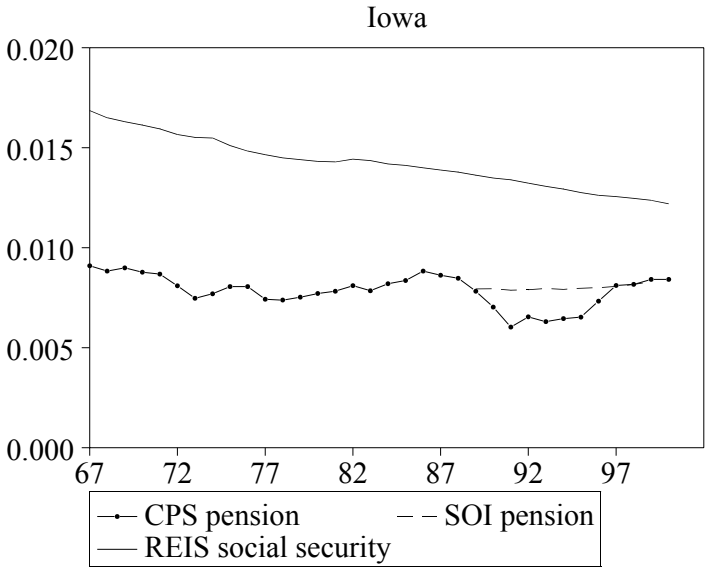

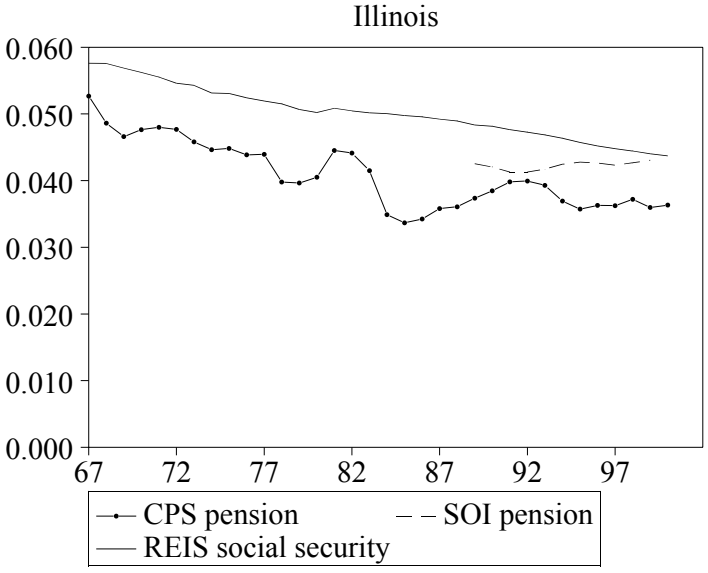

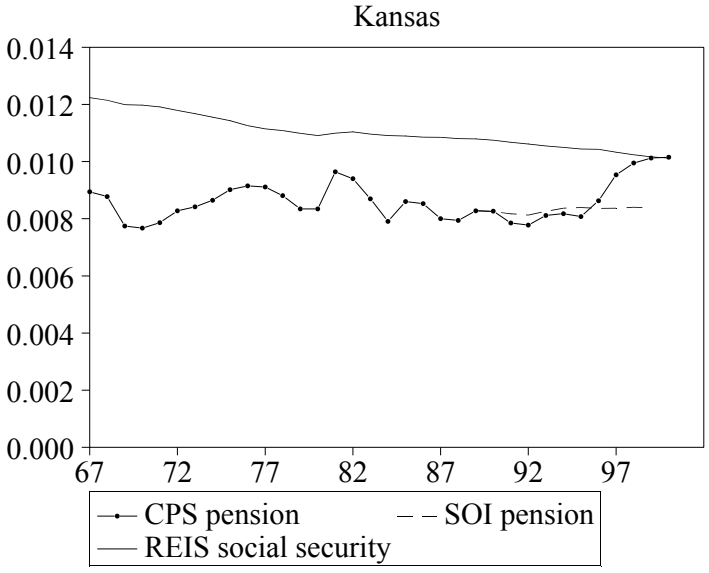

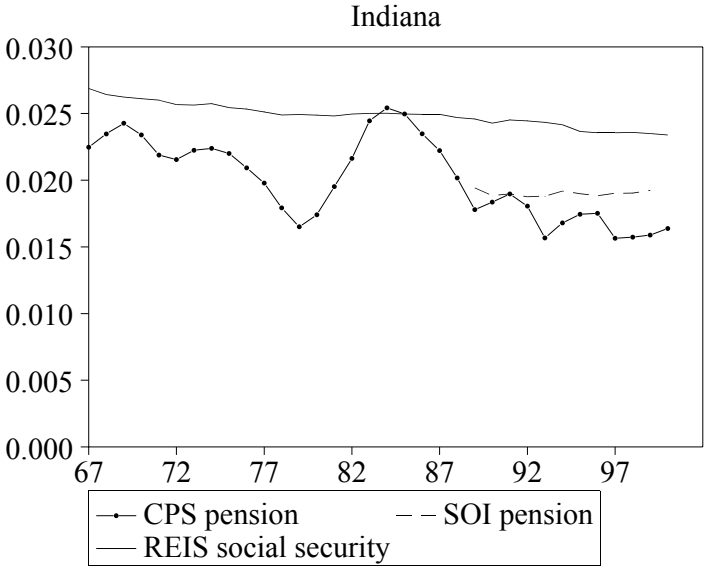

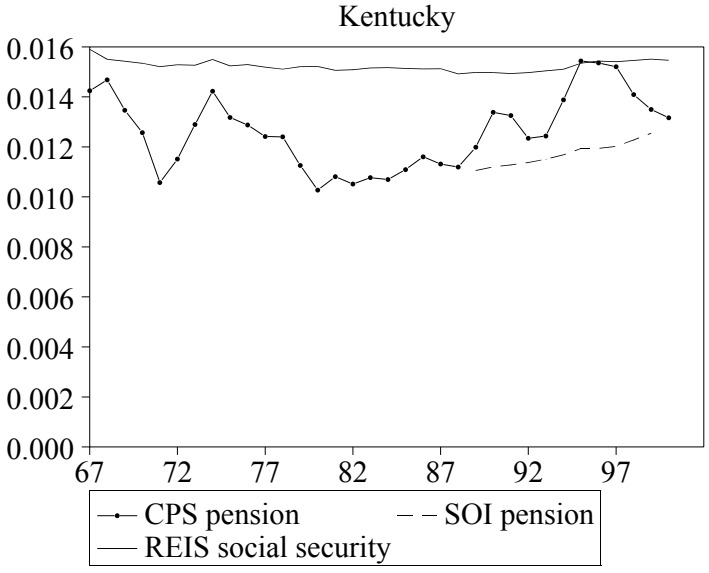

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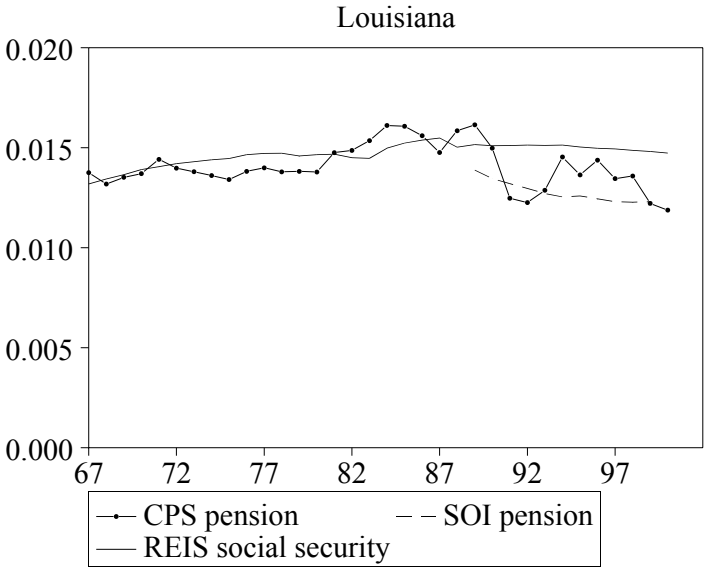

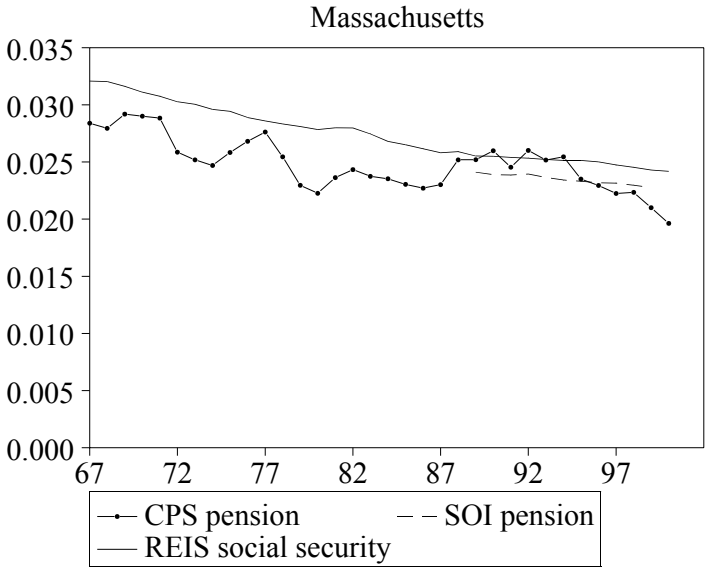

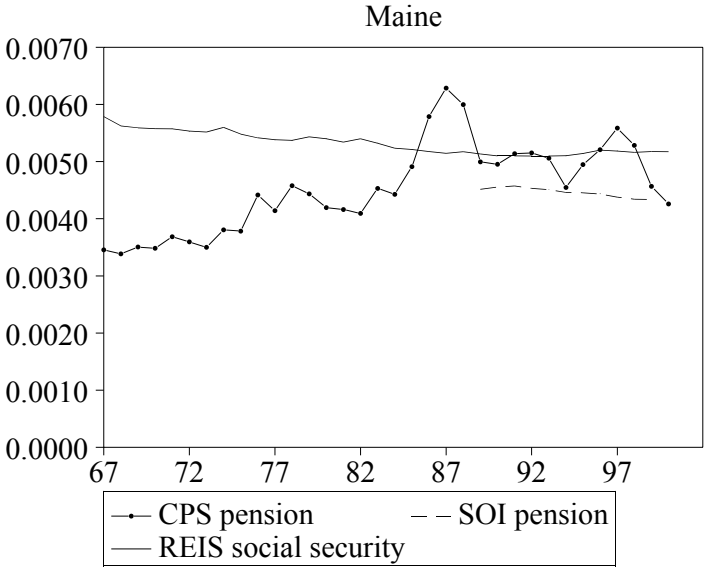

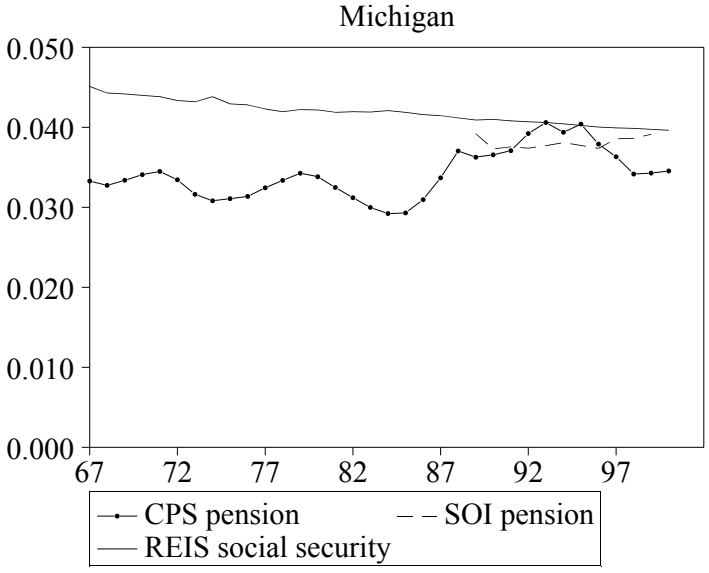

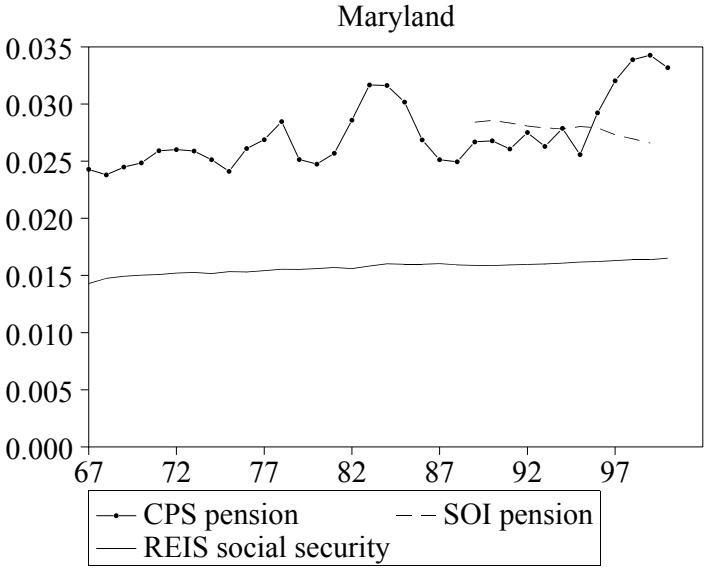

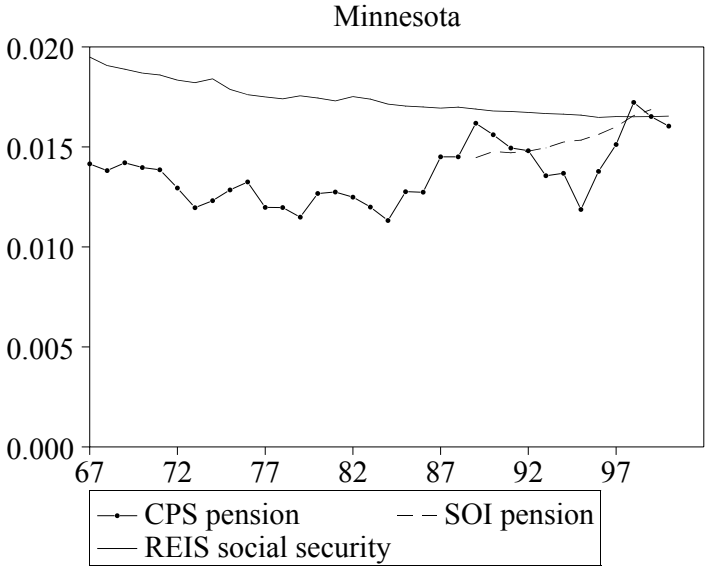

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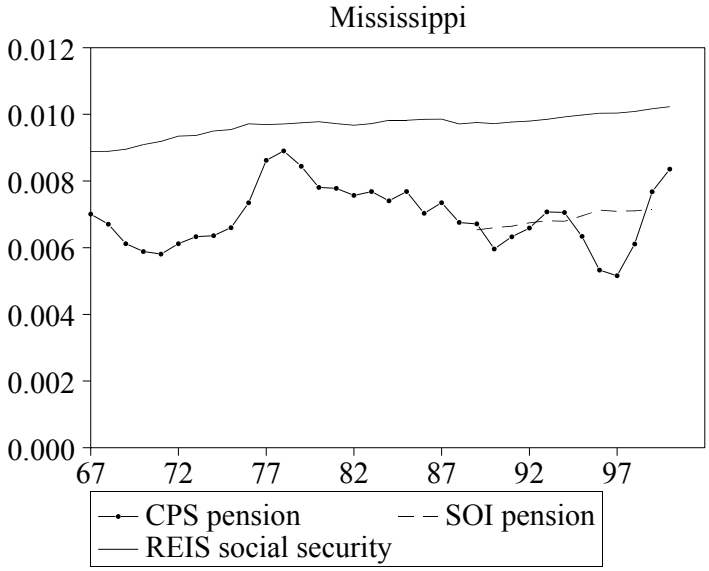

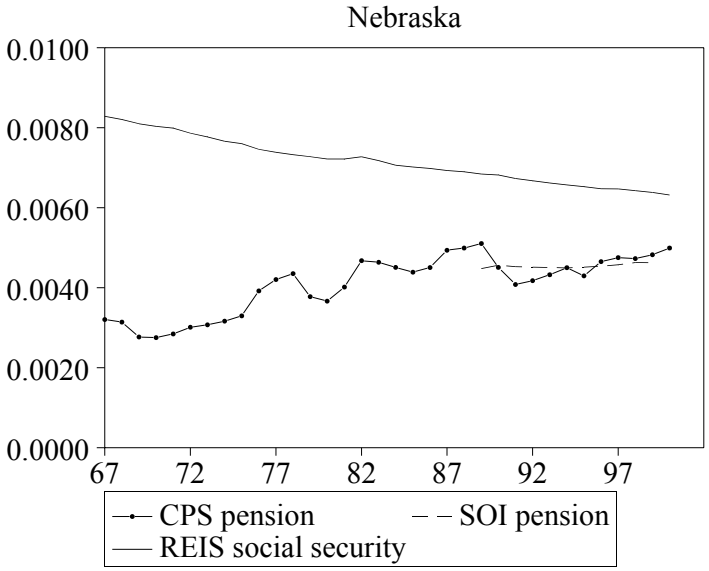

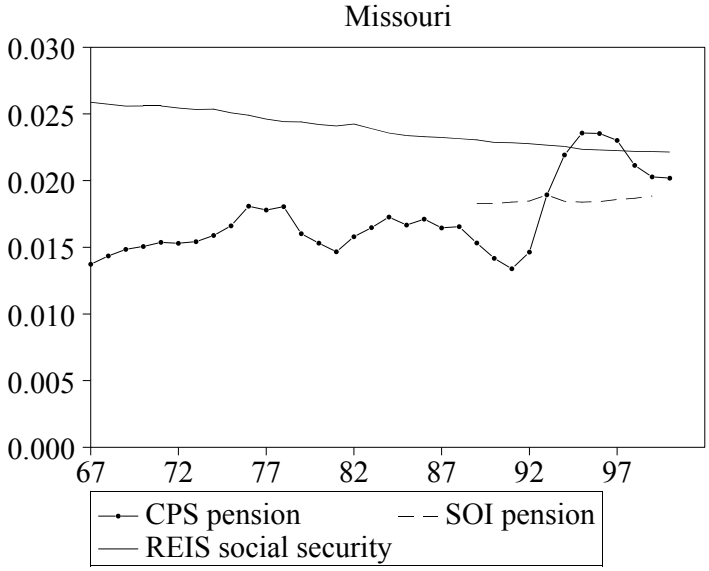

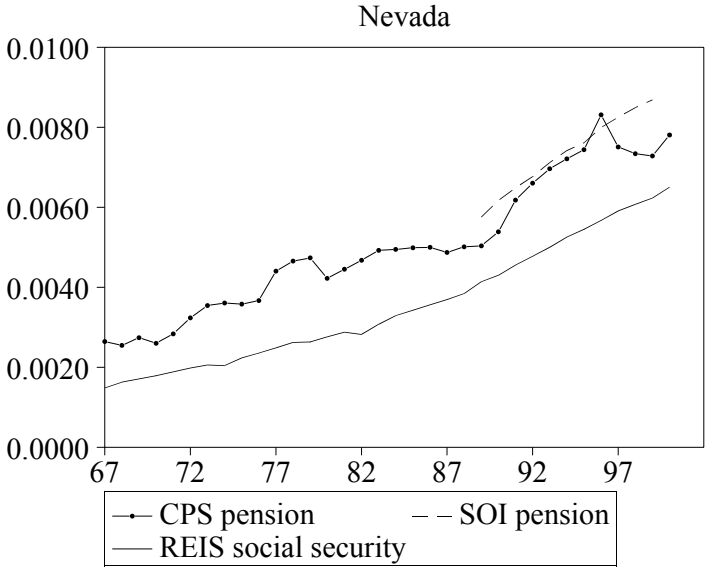

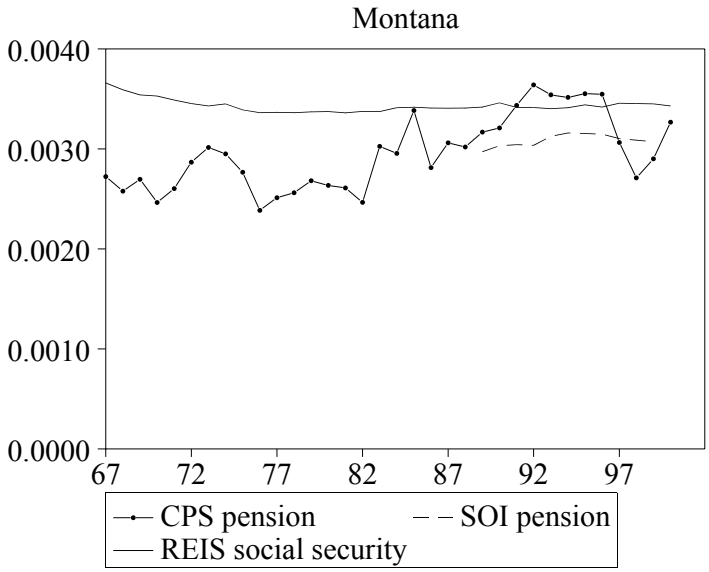

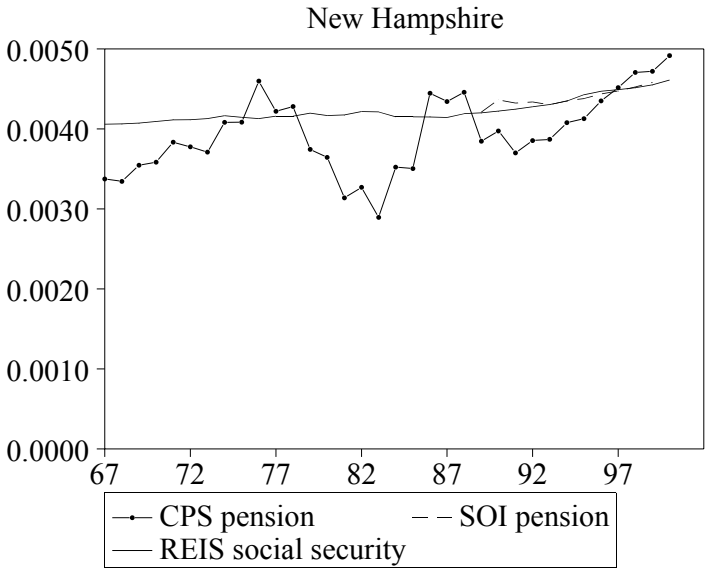

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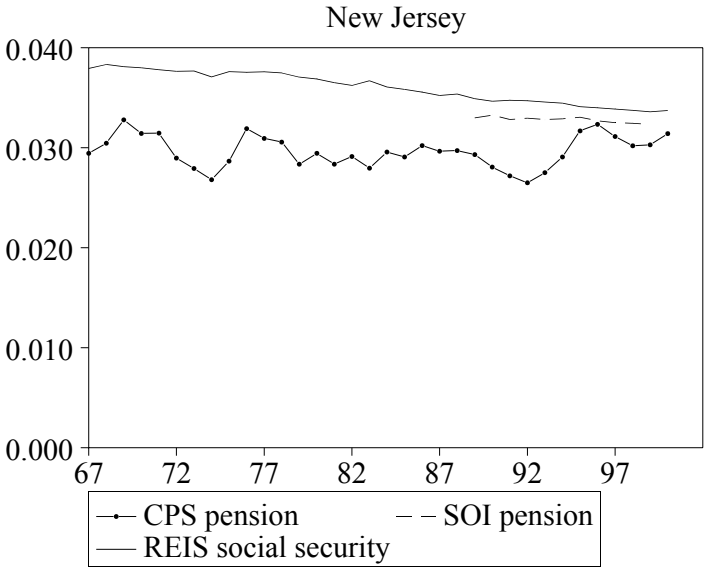
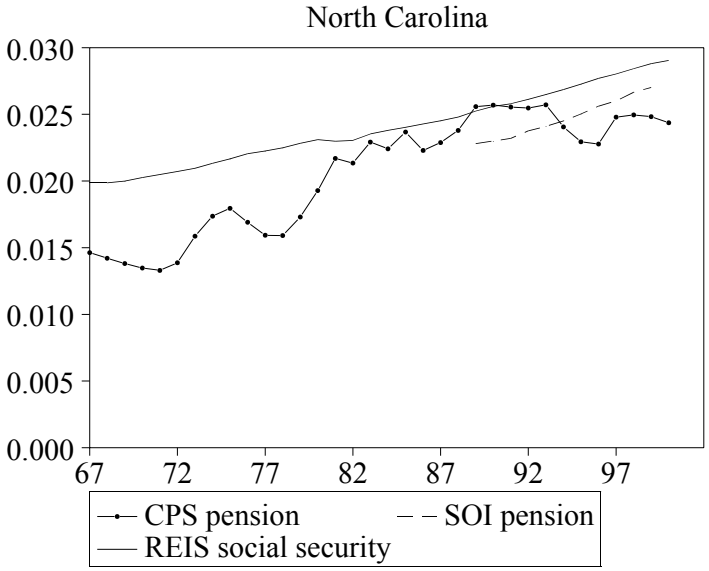
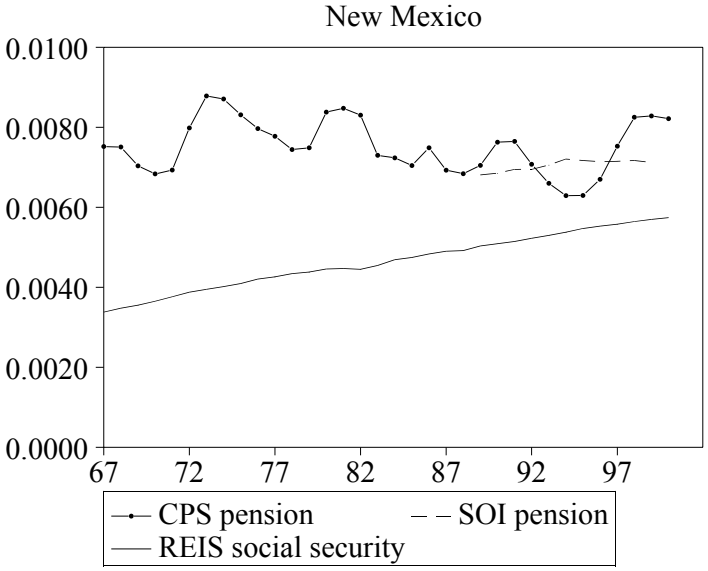
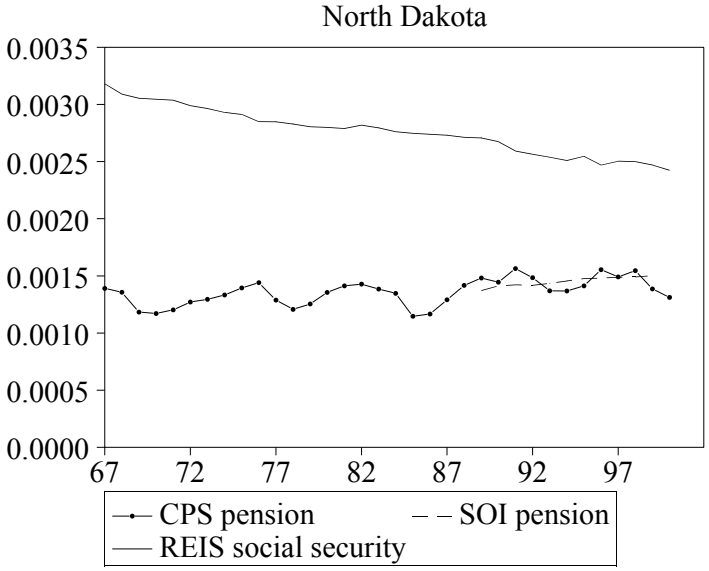
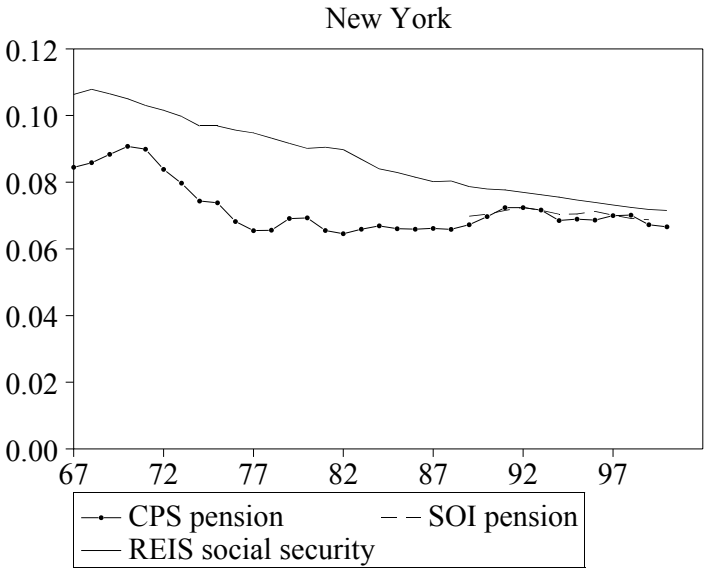










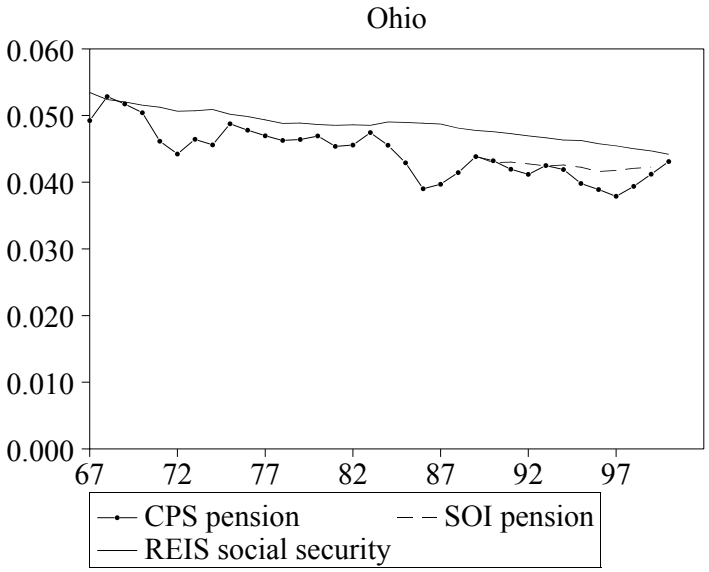
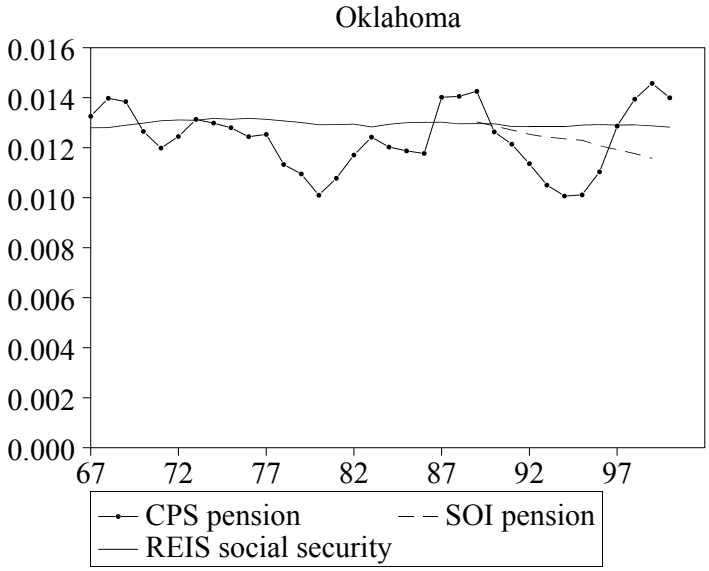
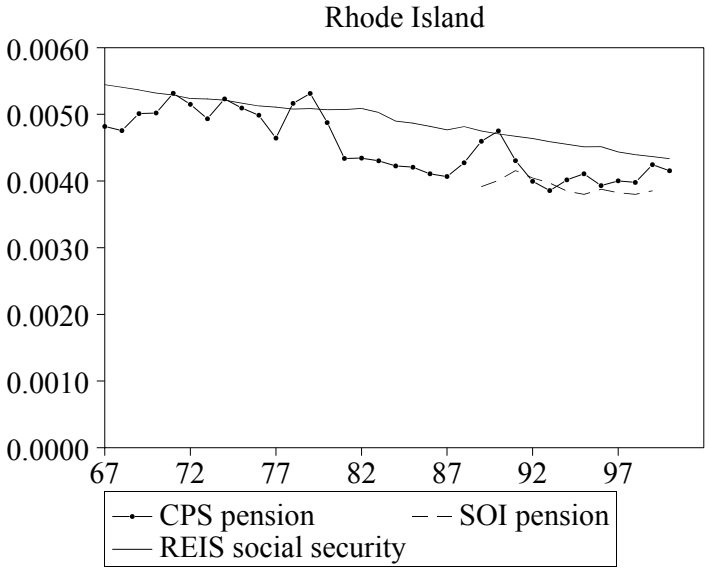
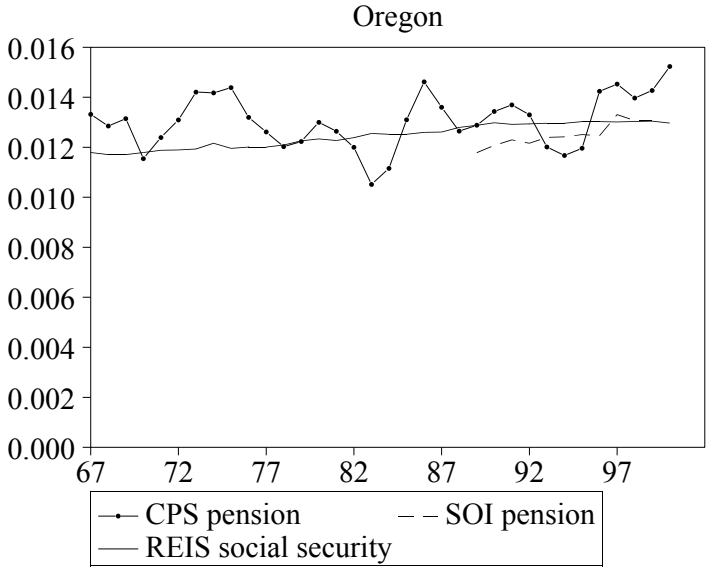
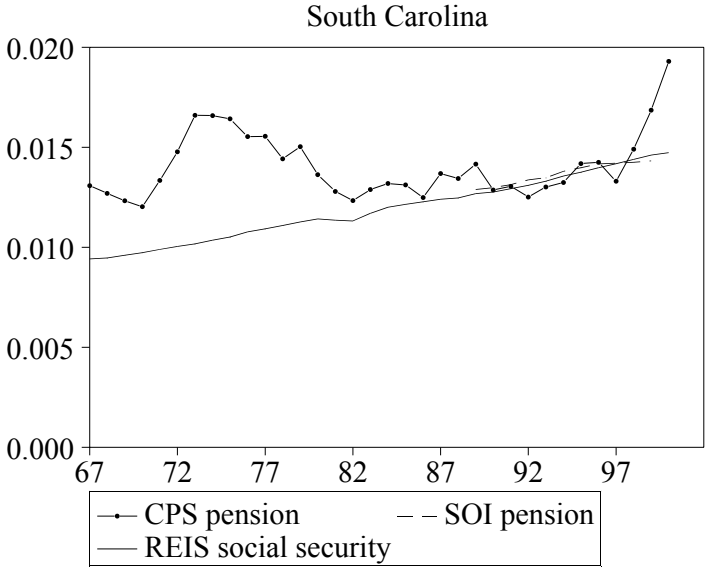


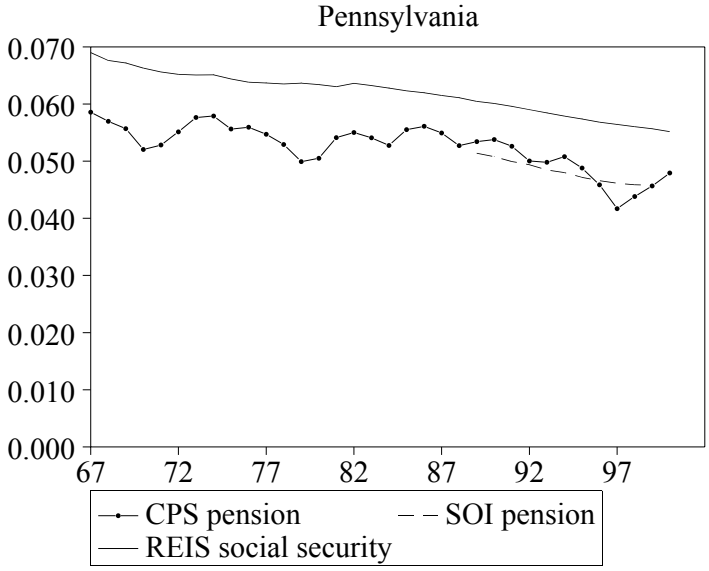
Figure 5--continued











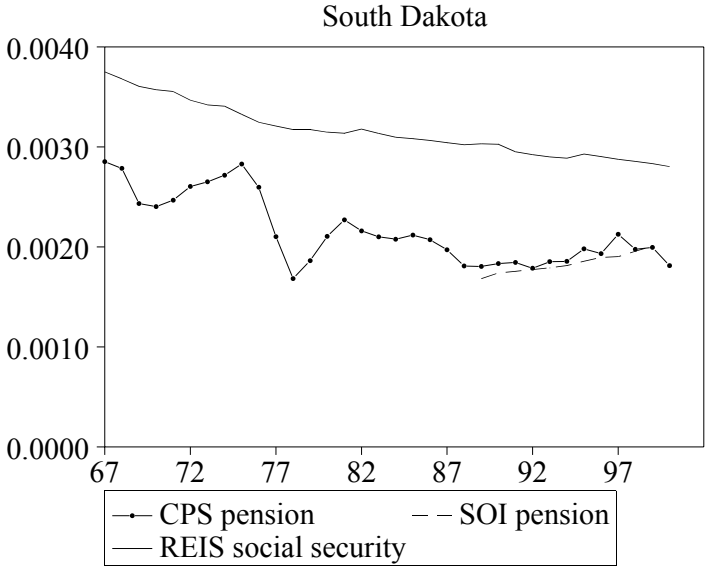
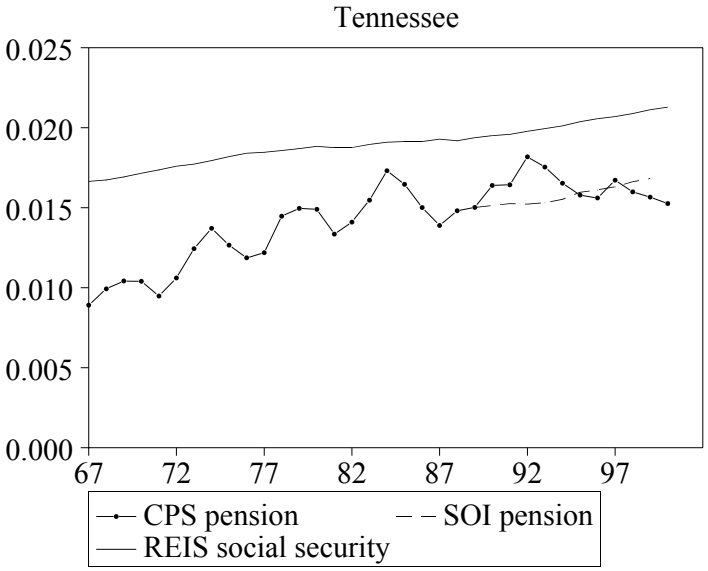
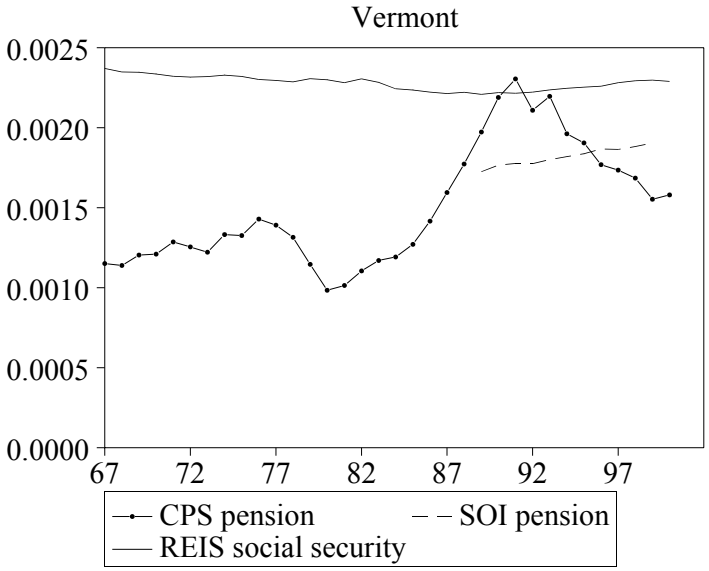
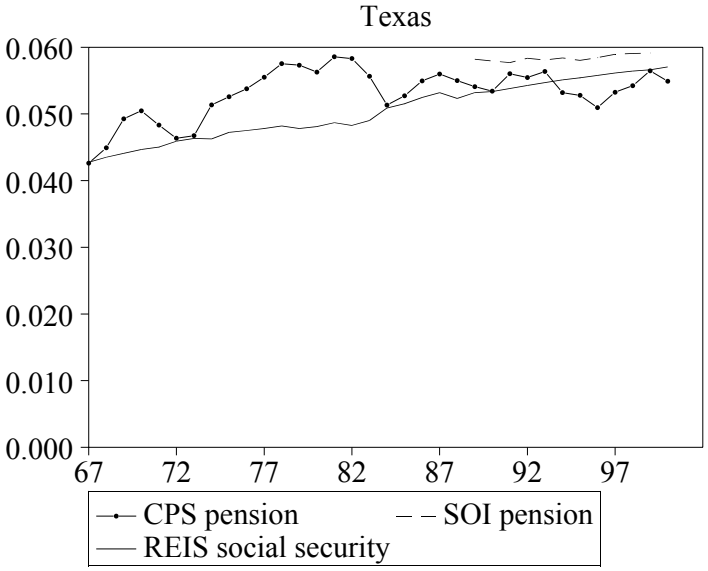
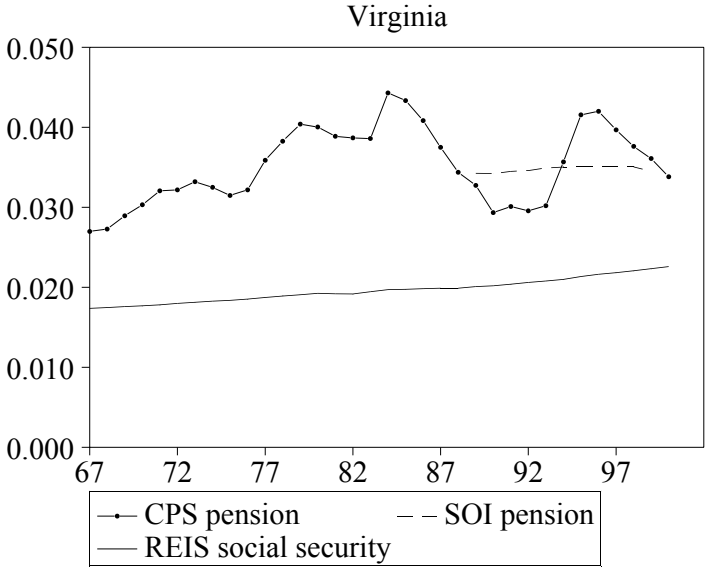


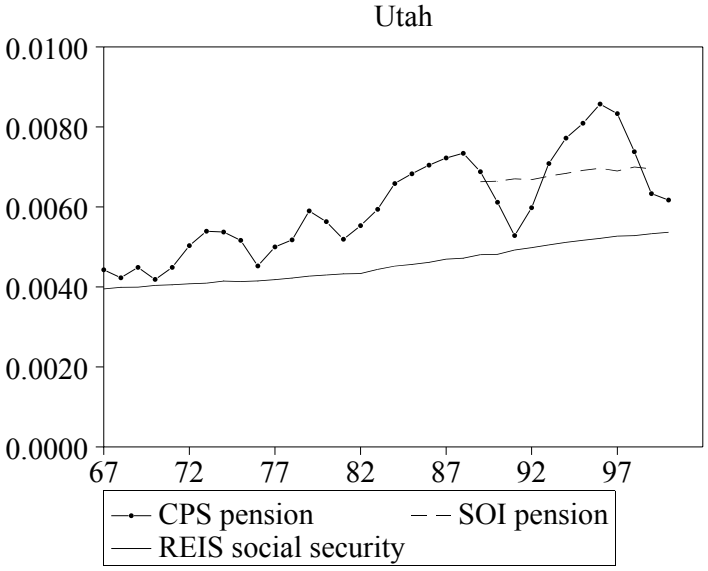
Figure 5--continued

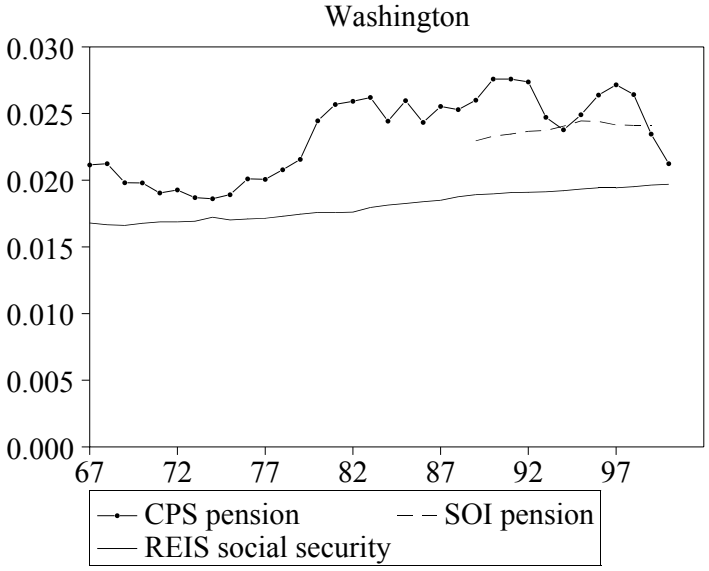












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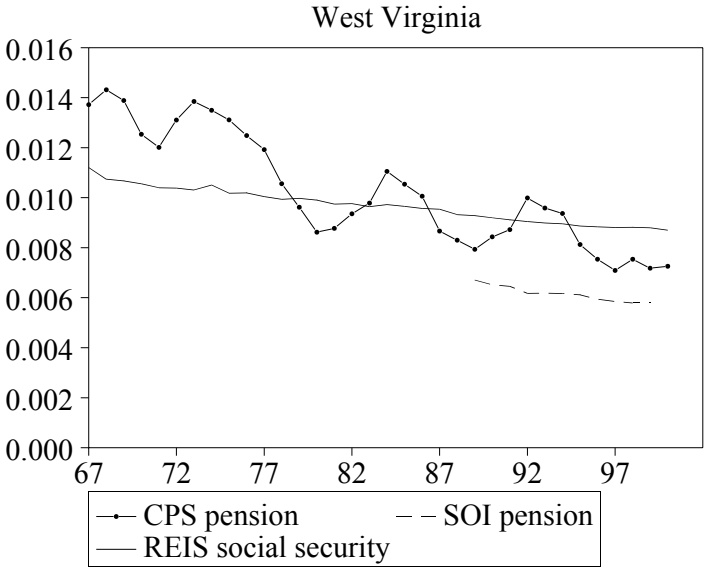
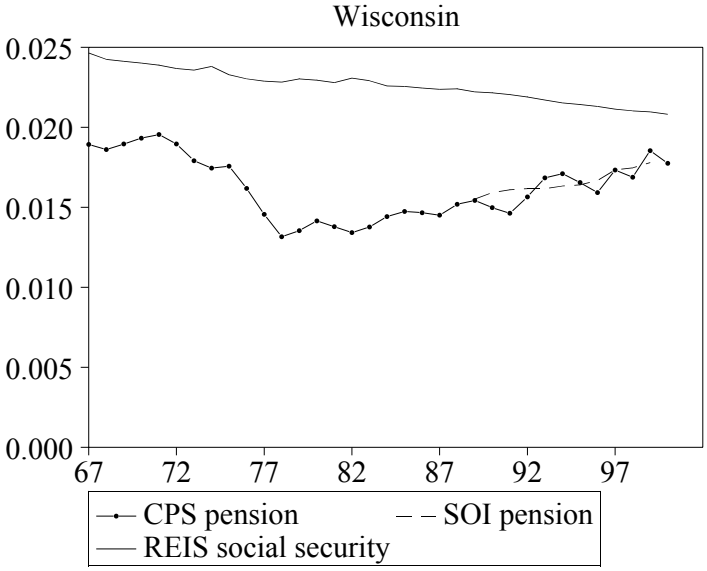




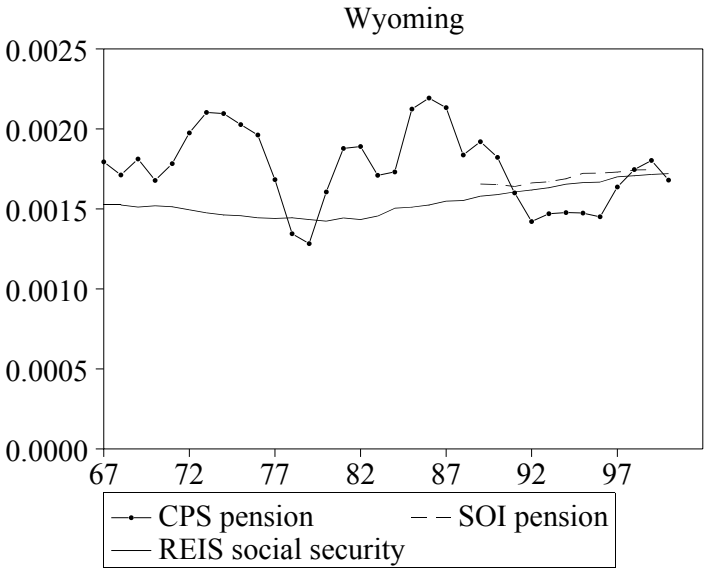


Figure 6. Pension and Social Security Benefits

(billions of dollars)

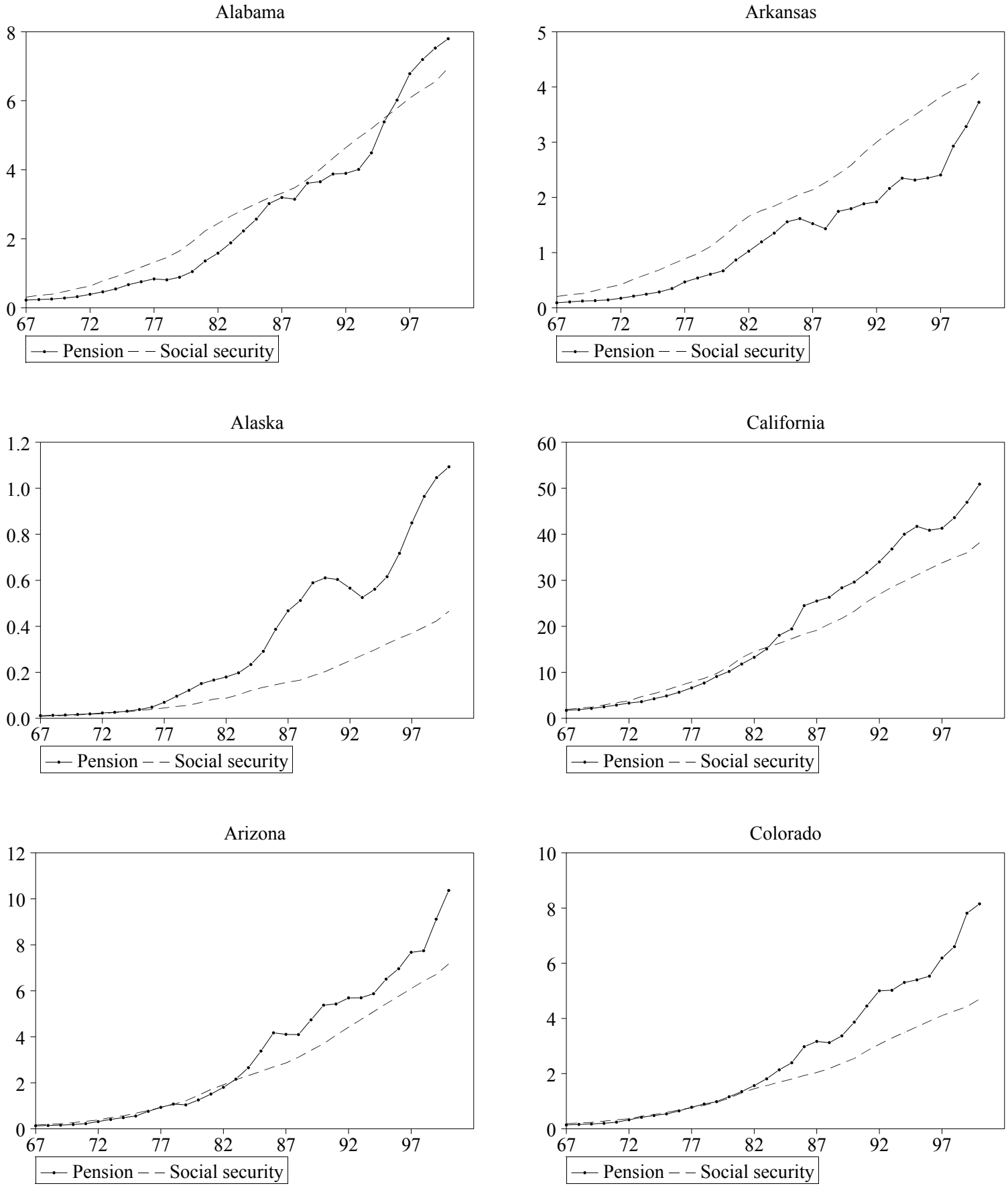
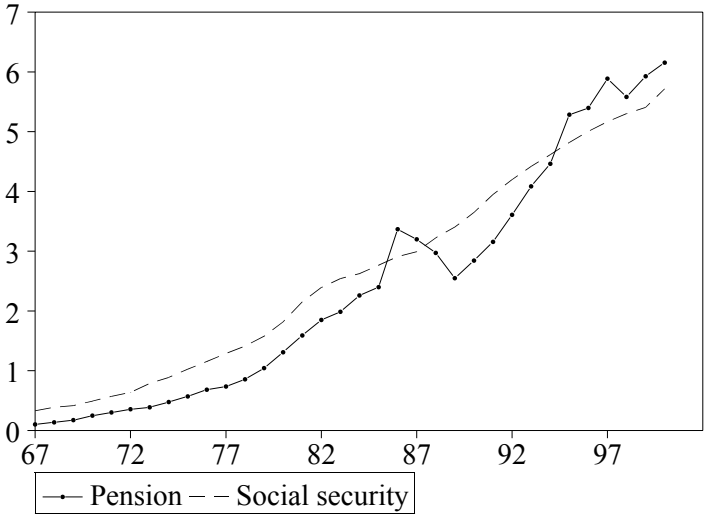


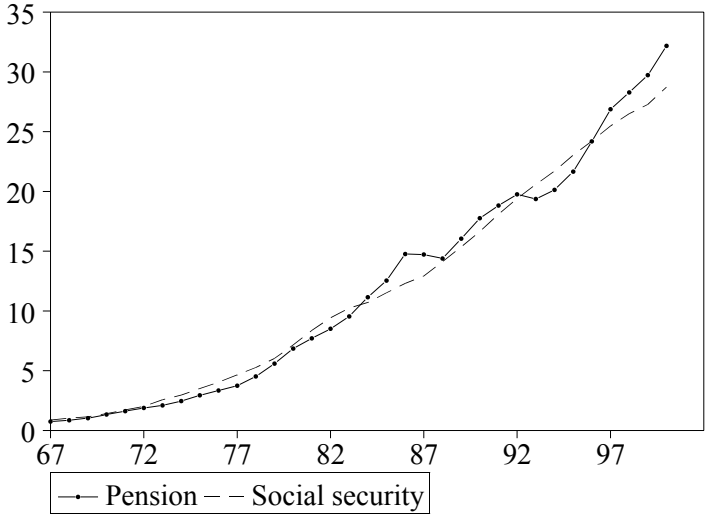
Figure 6--continued

(billions of dollars)

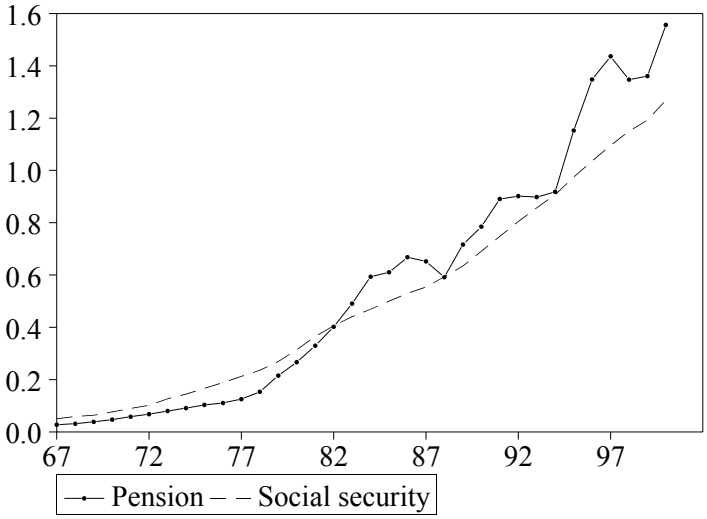
Connecticut



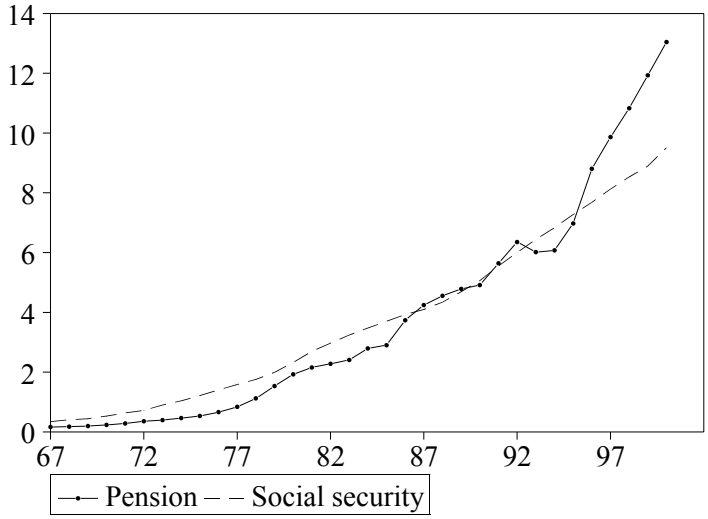
Florida



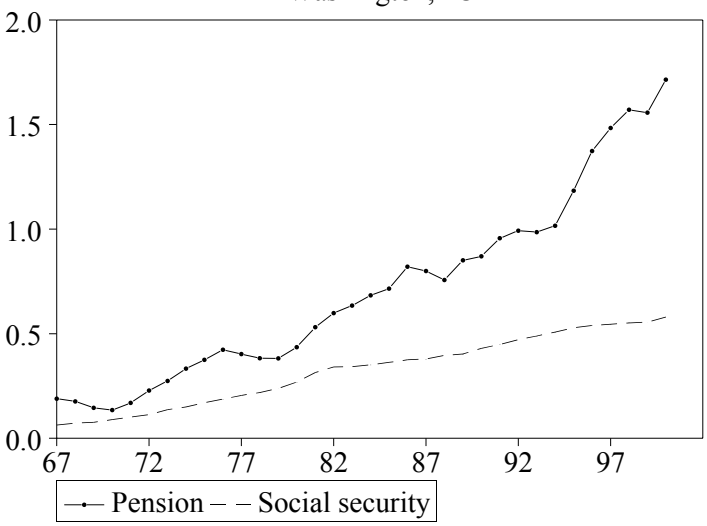
Delaware



Georgia



Washington,DC



Hawaii

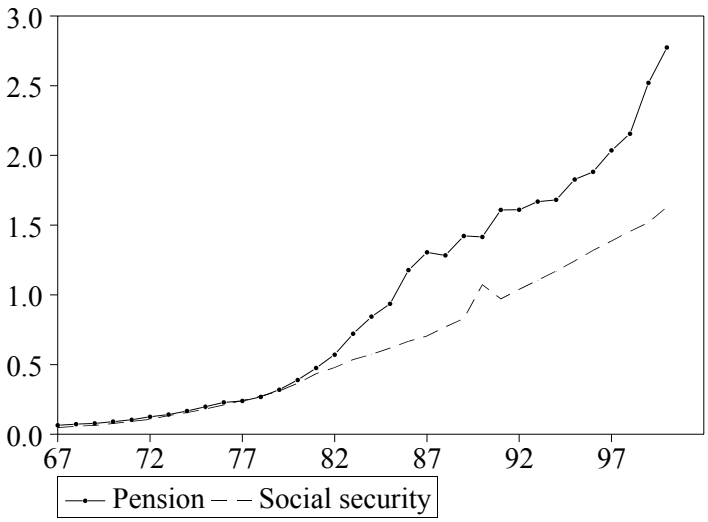
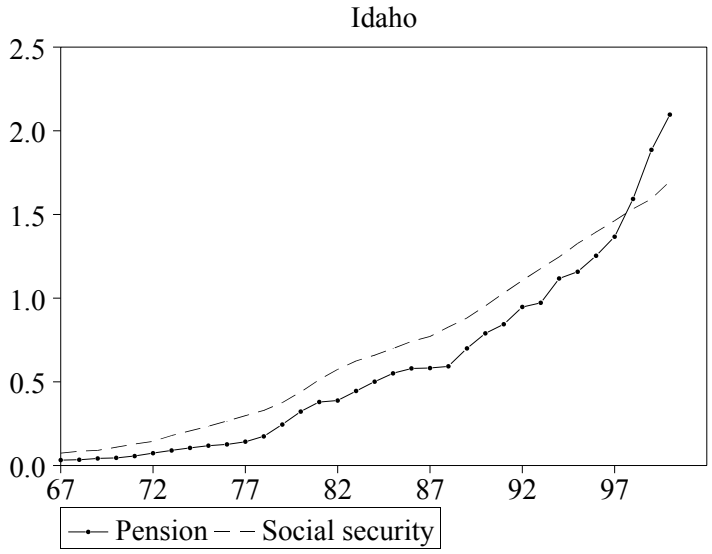
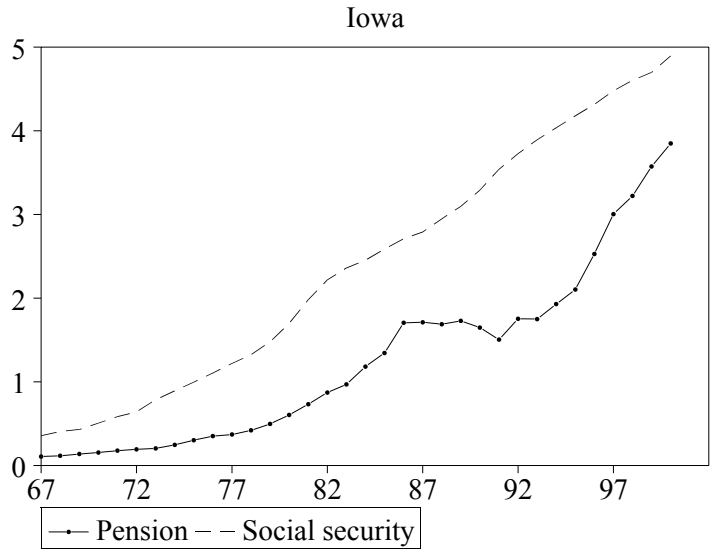
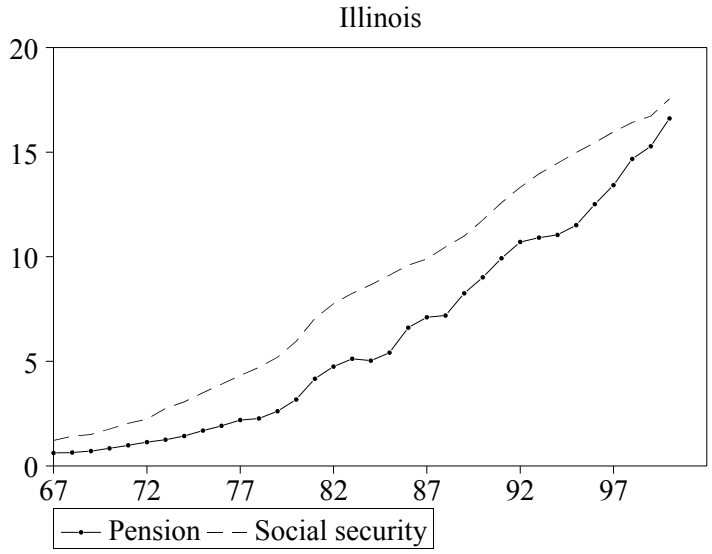


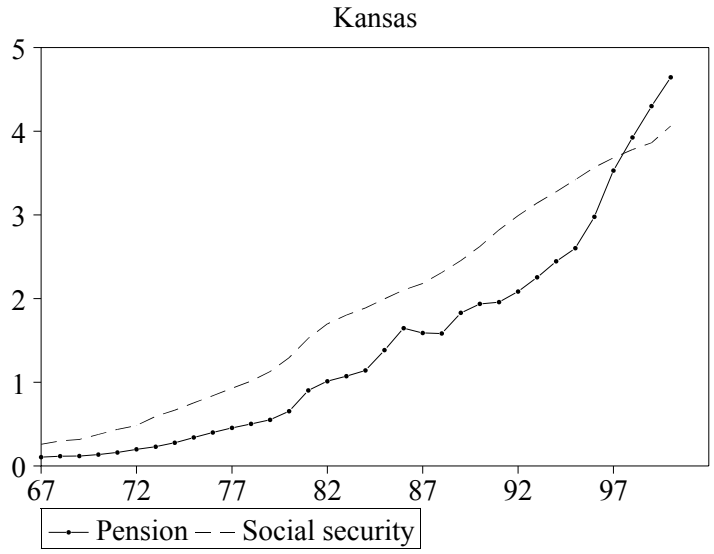
Figure 6--continued

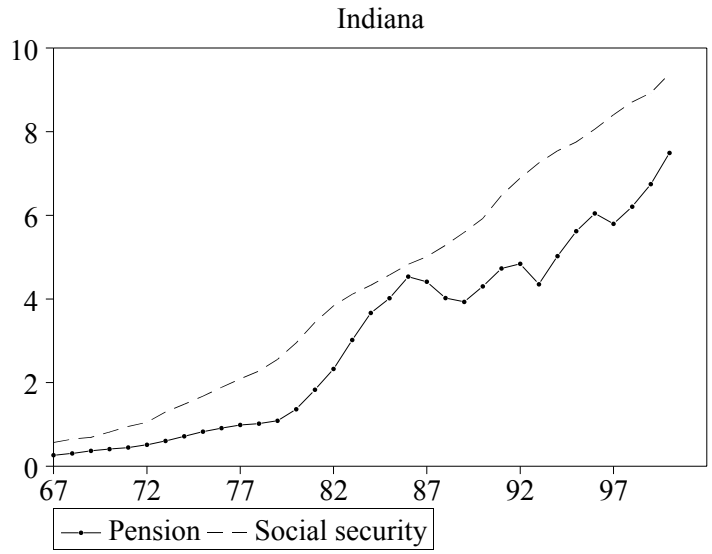
(billions of dollars)











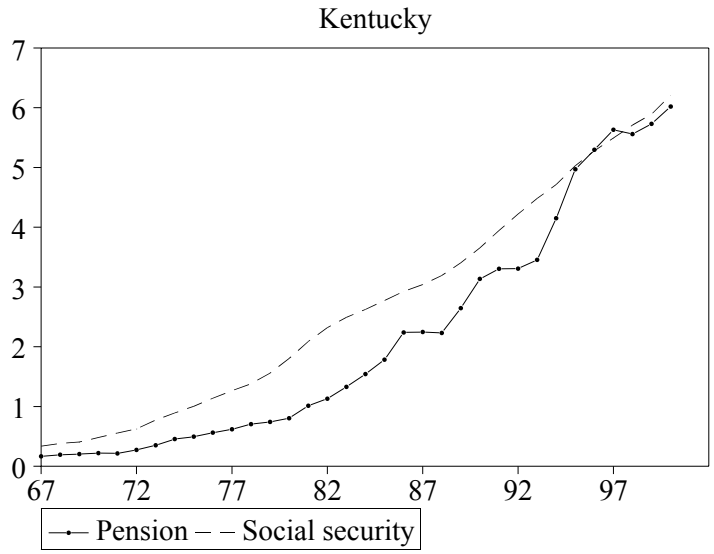
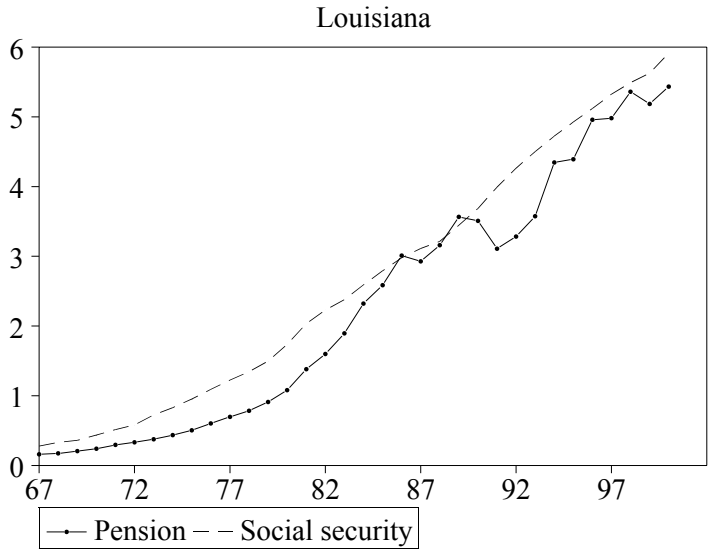
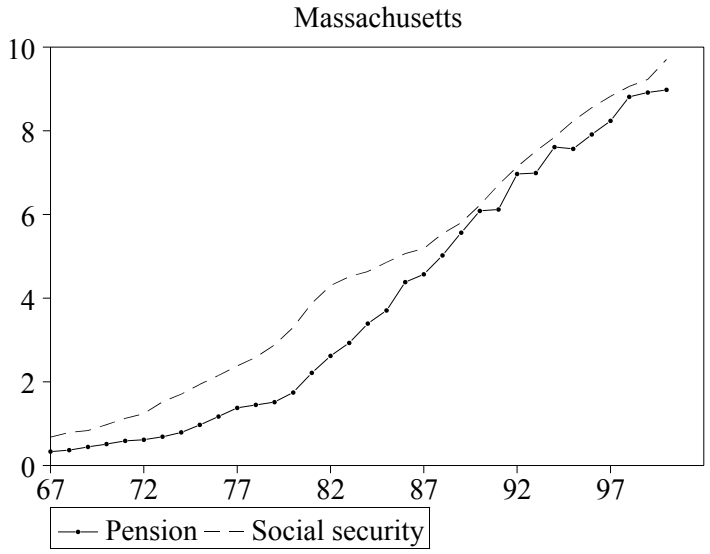
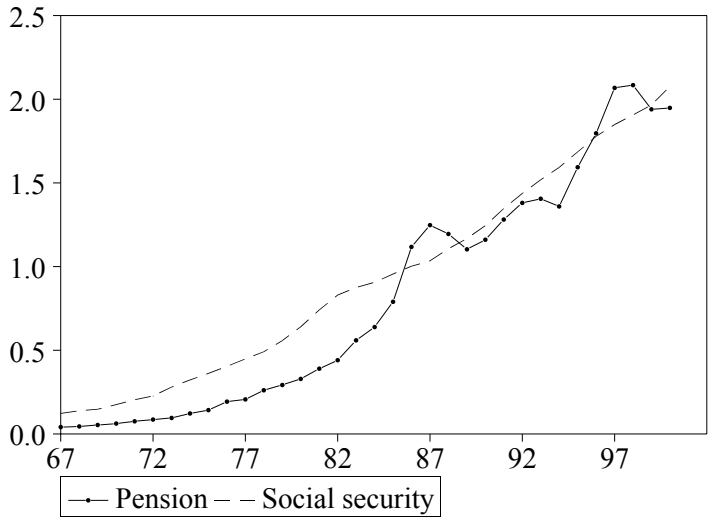


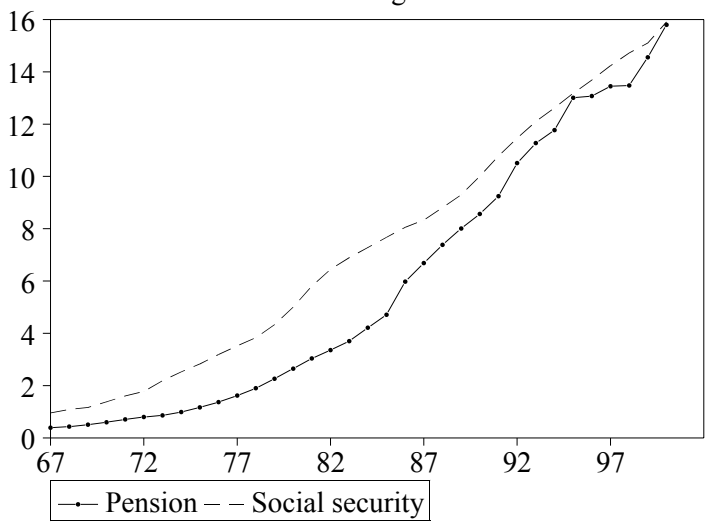
Figure 6--continued

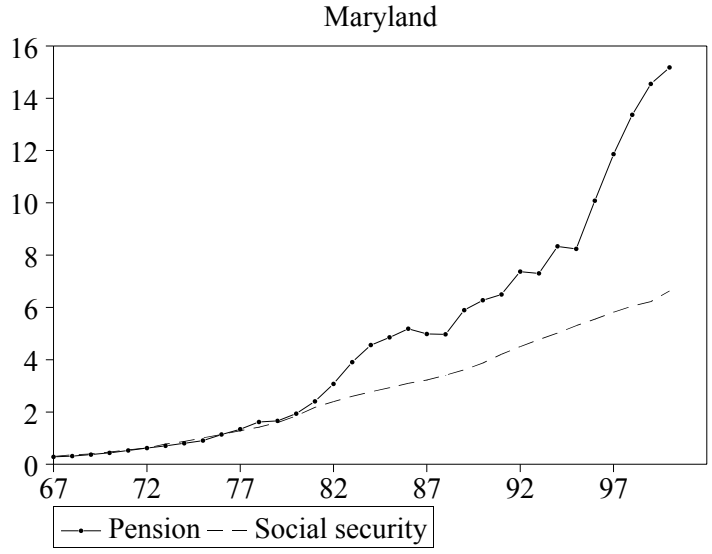
(billions of dollars)











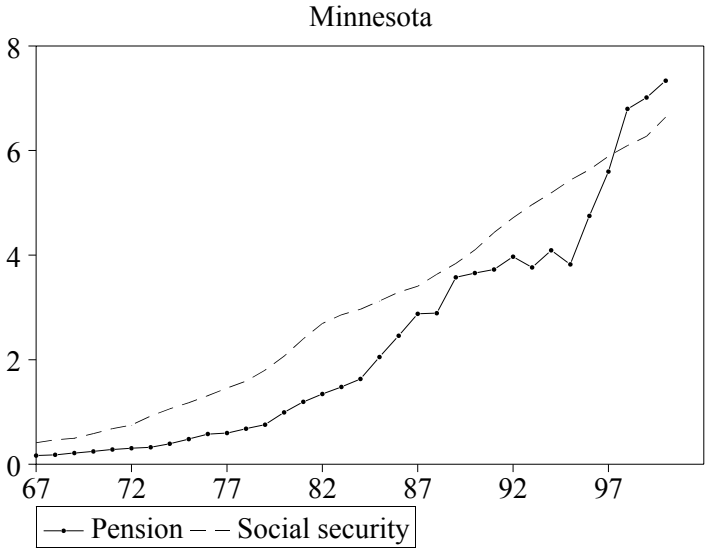
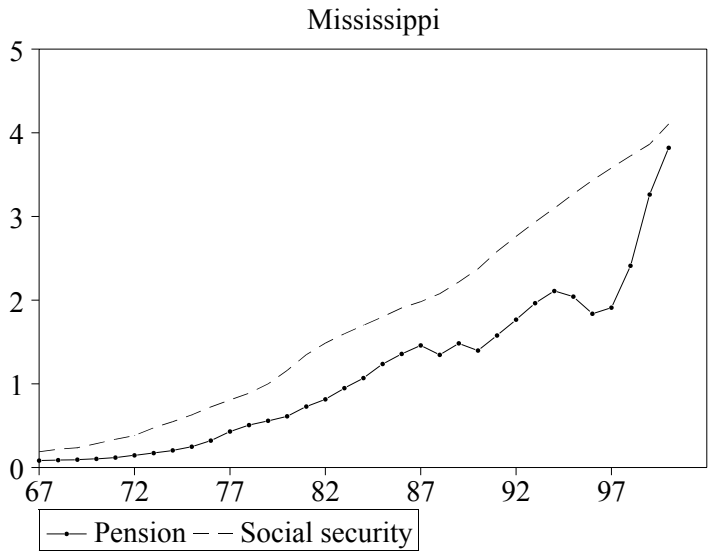
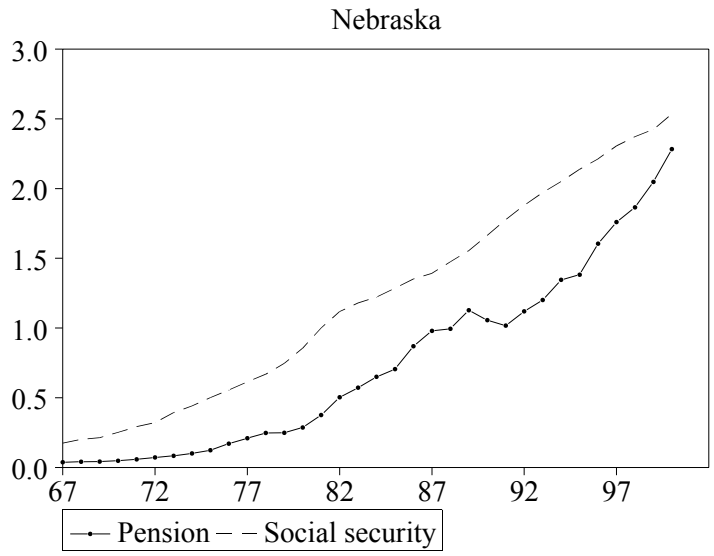
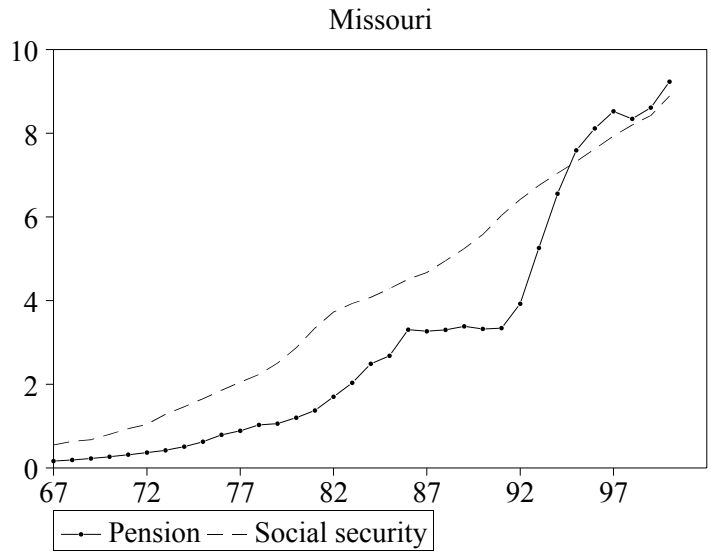


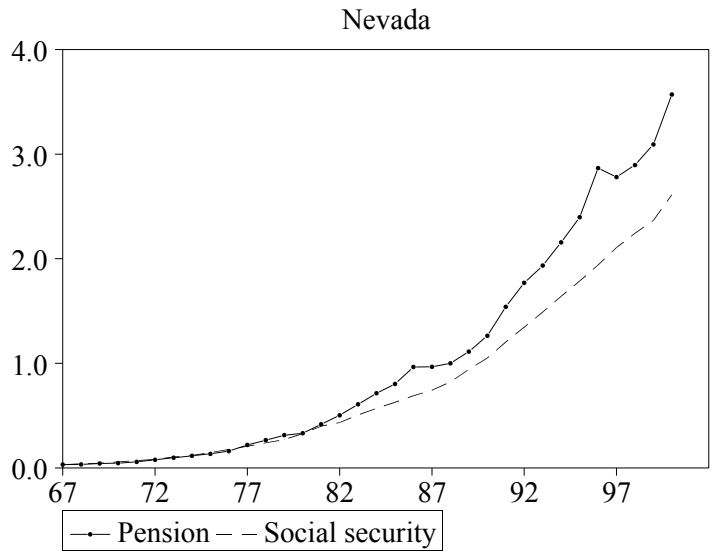
Figure 6--continued

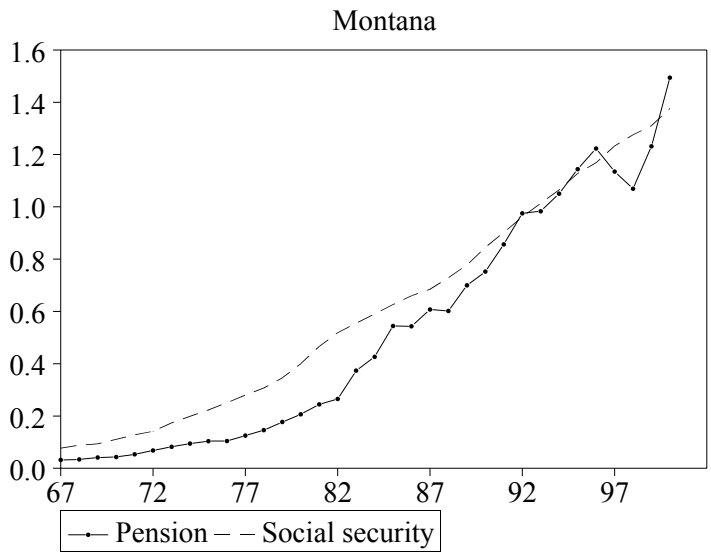
(billions of dollars)











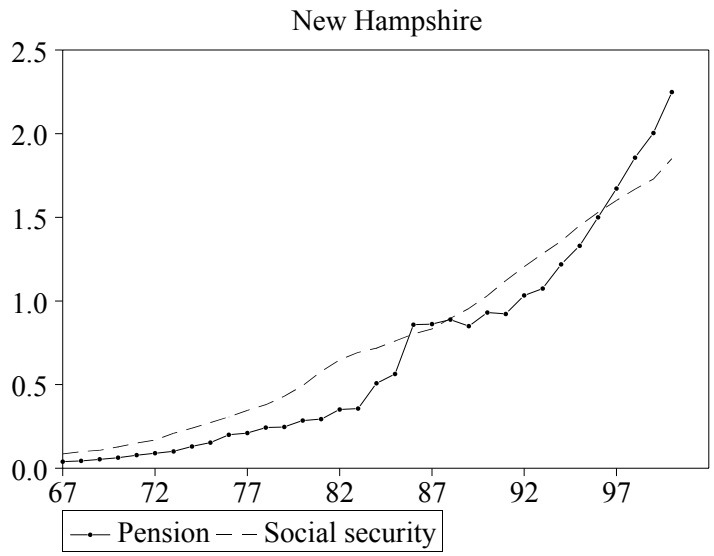
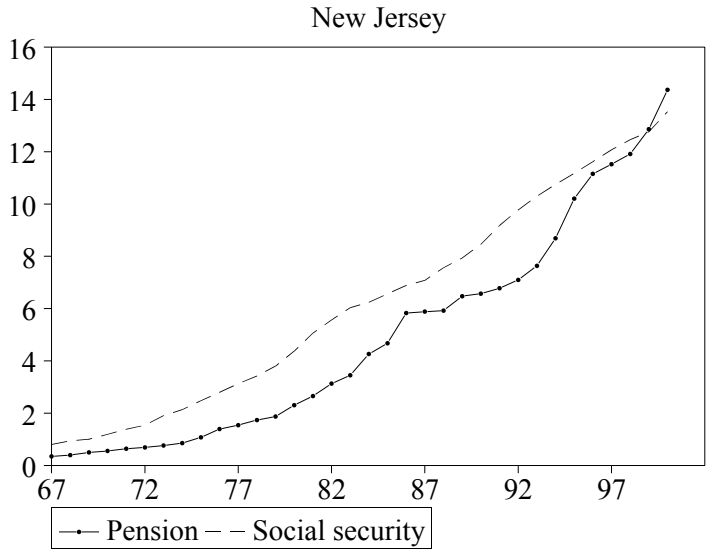
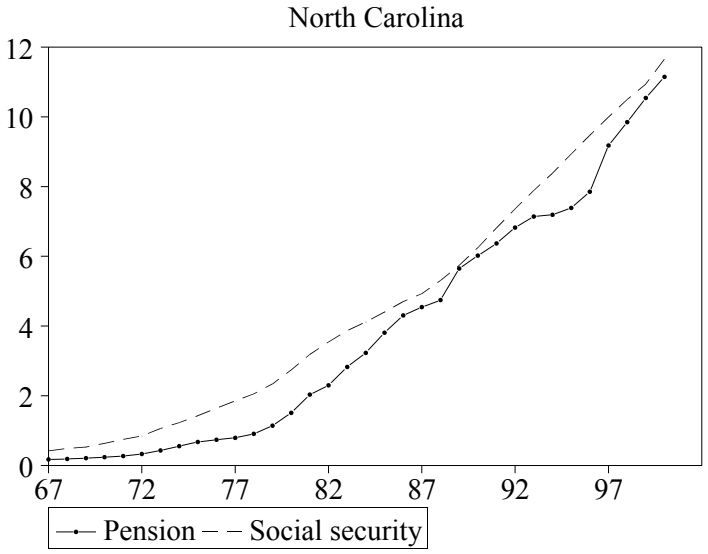
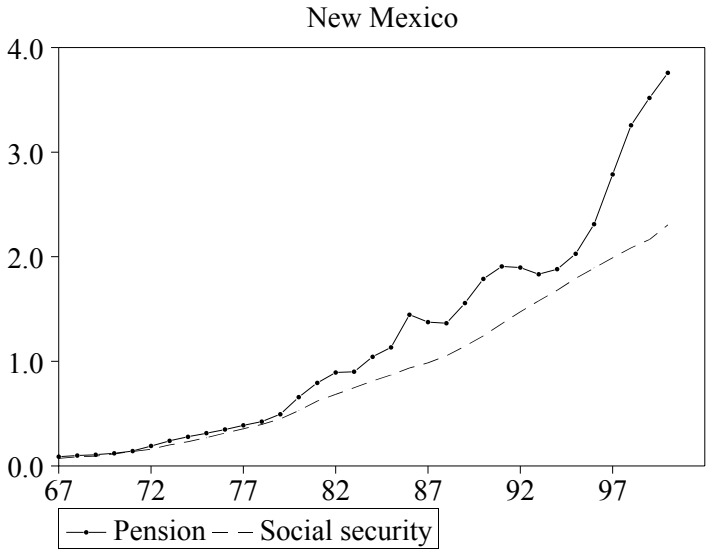


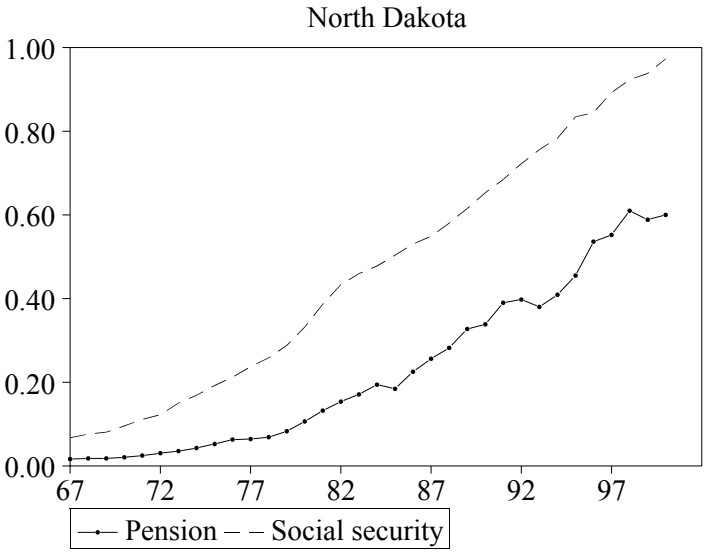
Figure 6--continued

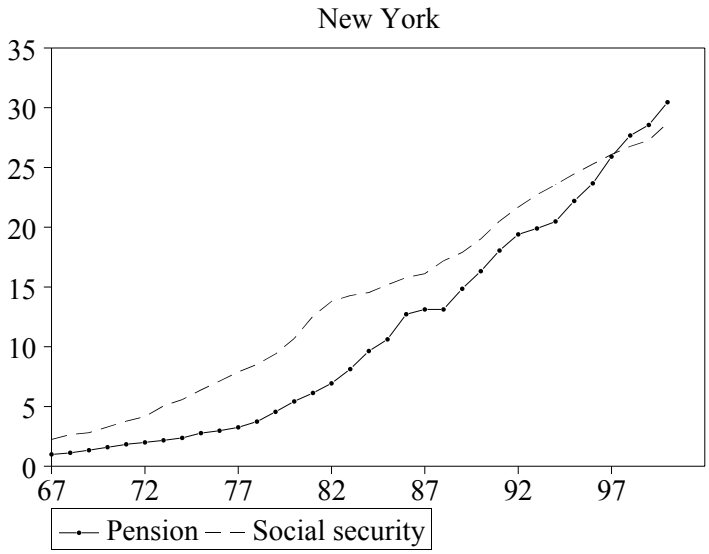
(billions of dollars)











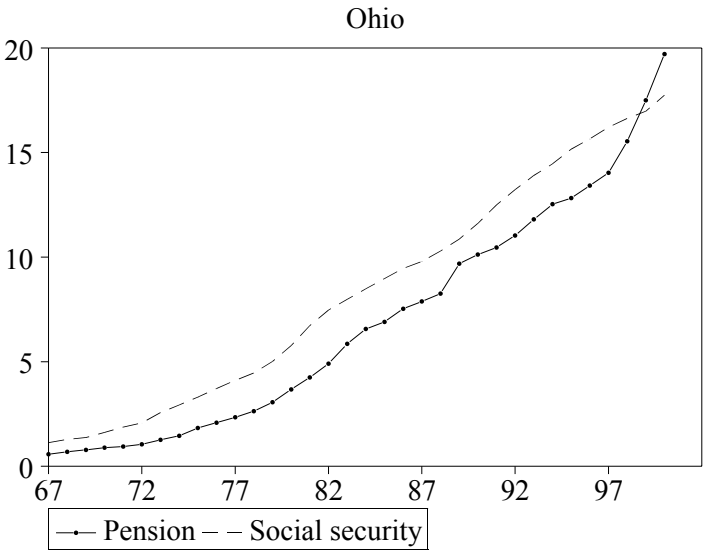
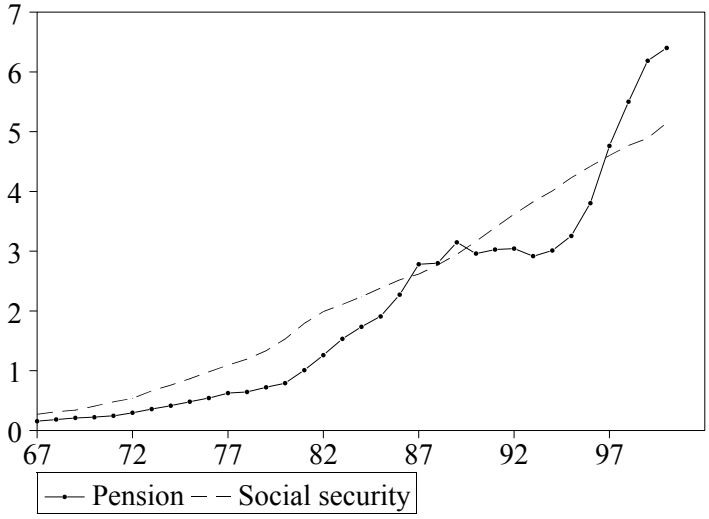


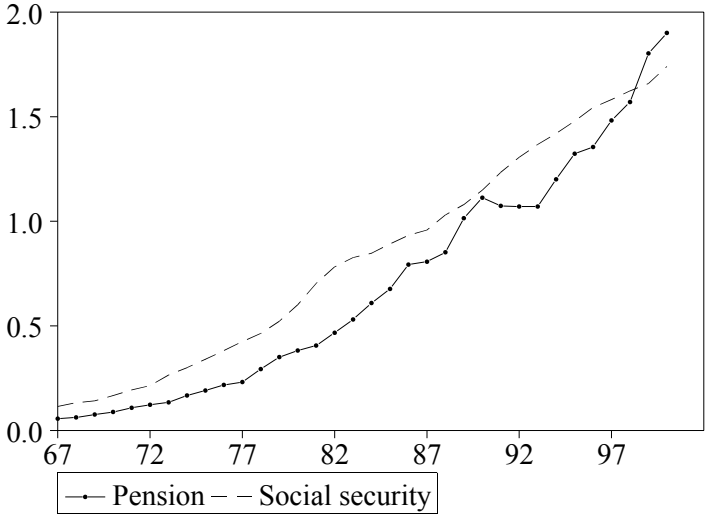
Figure 6--continued

(billions of dollars)

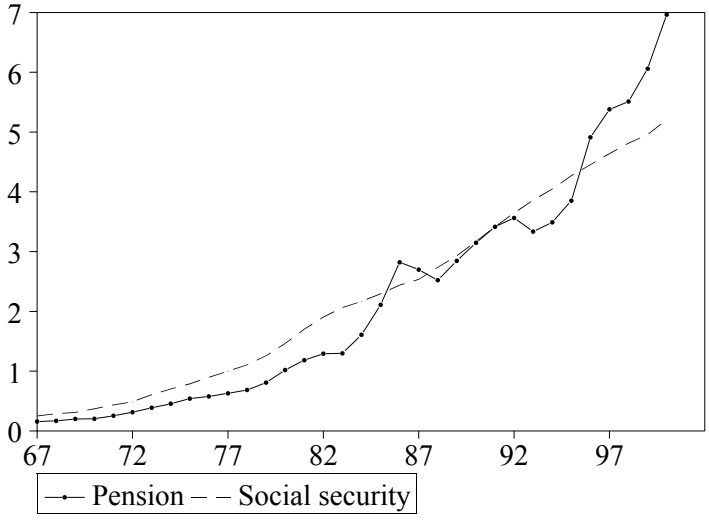
Oklahoma



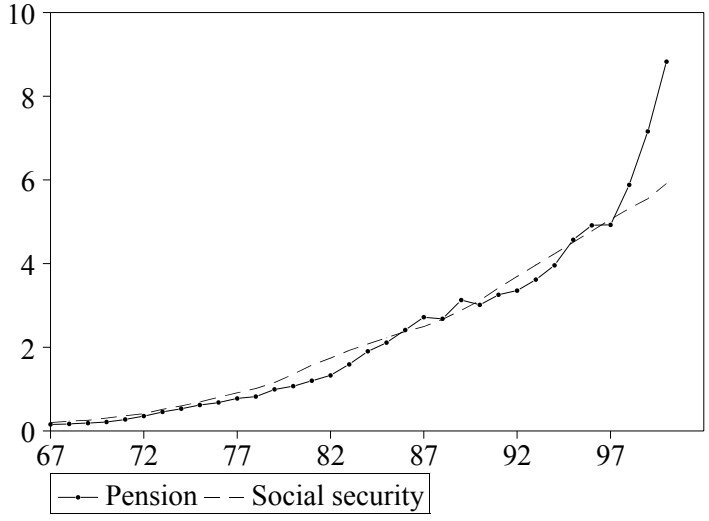
Rhode Island



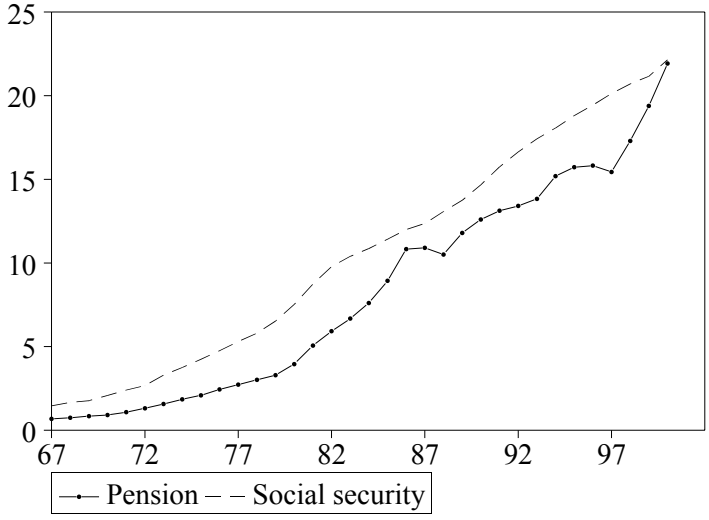
Oregon



South Carolina



Pennsylvania



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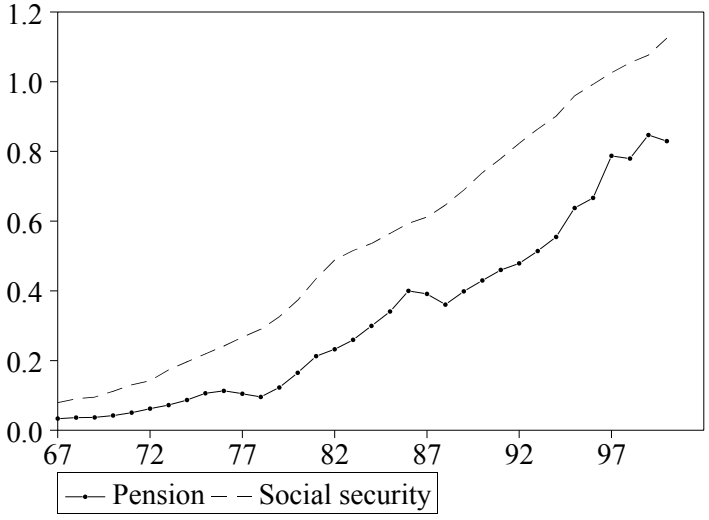

Figure 6--continued

(billions of dollars)

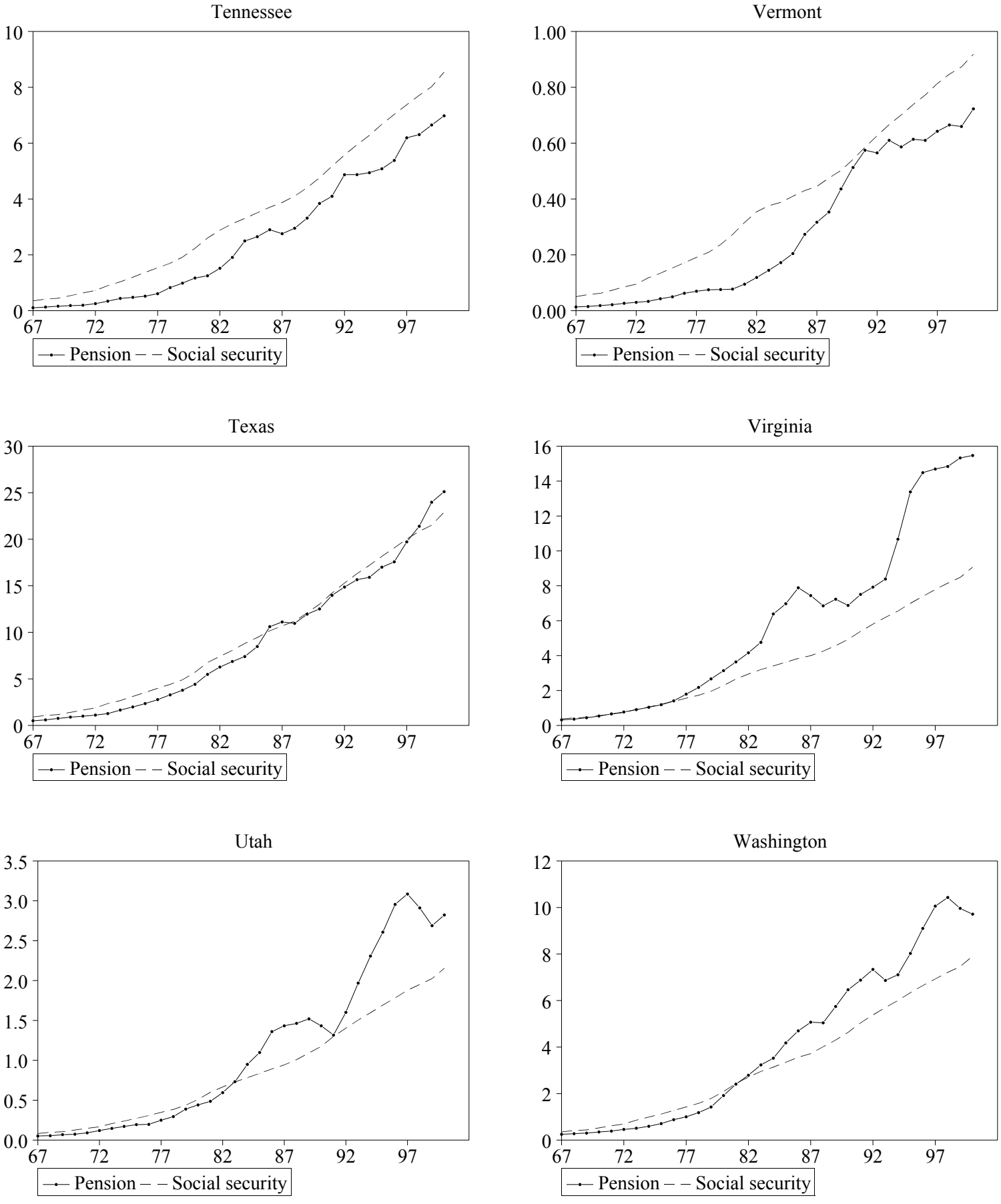

Figure 6--continued

(billions of dollars)