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Poverty among the Elderly.

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Social Security and the Evolution of Elderly Poverty

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Abstract

We use data from the March 1968-2001 Current Population Surveys to chart the evolution of elderly income and poverty, and document dramatic declines in absolute poverty as measured by the federal family-size-adjusted poverty threshold, but only modest declines in relative poverty measured as 40 percent of median non-elderly income. We develop an instrumental variable approach relies on the large exogenous shifts in benefits generosity for cohorts born in the 1910-1921 period, the so-called Social Security notch, to estimate the causal effect of Social Security on elderly poverty. Our findings suggest that average over all elderly families the elasticity of poverty to benefits is roughly unitary. This suggests that reductions in Social Security benefits would significantly alter the poverty of the elderly.

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One of the most striking trends in elderly well-being in the twentieth century was the dramatic decline in income poverty among the elderly. The official poverty rate of those 65 years and older was 35 percent in 1960, more than twice that of the non-elderly (those 18-64), and had fallen to 10 percent by 1995, below that for the non-elderly. Smolensky, Danziger and Gottschalk (1988) found similar steep declines in elderly poverty back to 1939. This poverty reduction exceeded that for any other group in society.

The rapid growth in Social Security benefits in the post-World War II period is often cited as a major factor in elderly poverty reduction. This conclusion is based on evidence such as that shown in Figure 1, which plots both the elderly poverty rate and Social Security program expenditures per capita over time; the figure is rescaled so that both series fit on the same graph. There is a striking negative association between these series, with elderly poverty declining rapidly as the Social Security program grows quickly in the 1960s and 1970s, and then declining more slowly as program growth slows in the 1980s and 1990s. One concern with potential reforms to the Social Security system is that, to the extent they effectively involve benefit reduction, the gains in elderly poverty reduction over the last forty years may be reversed.

Our goal in this paper is to provide a more in-depth exploration of this important trend. We do so in three steps. First, we consider how robust this time series conclusion is to alternative measures of the position of low-income elders. In particular, we contrast the evolution of *absolute* poverty, defined relative to a constant real standard of living, to the evolution of *relative* poverty, defined relative to 40% of the median income of the nonelderly. We also move beyond simple knife-edge measures of poverty to consider as well the depth of poverty, as measured by the absolute and relative poverty gaps of the elderly. Finally, we consider as well the evolution of income inequality within the elderly population over time.

Second, we assess the heterogeneity in the evolution of poverty among the elderly over the past several decades. In particular, we consider first whether these changes in poverty were reflected equally among the oldest old, who start with much higher poverty rates, and the youngest old. We then assess whether the trends were comparable across marital status groups, comparing elders who are married, divorced, widowed, and never married.

Third, we assess the causal role of Social Security in explaining these trends. We outline the econometric problems in the previous literature on the impact of Social Security on elderly income poverty and propose an instrumental variable procedure to circumvent these difficulties. We then examine the effect on poverty of the large exogenous changes in Social Security benefits that affected birth cohorts from 1910 through 1921. The early cohorts in this range saw enormous exogenous increases in Social Security benefits due to double indexation of the system in the early 1970s. This double indexing was ended in the 1977 Amendments to the Social Security Act that generated the so-called "benefits notch." The 1977 law grandfathered all individuals born before January 1, 1917, under the old benefit rules, but those born in 1917-1921 received benefit reductions that were as much as 20 percent lower than observationally equivalent individuals in the 1916 birth cohort. After 1921, benefits were roughly constant in real terms. It is this variation that was first identified by Krueger and Pischke (1992) as a fruitful means of identifying the behavioral effects of Social Security, in their case in the context of retirement decisions. We follow their methodology to define an instrumental variable for observed Social Security benefits.[1]

[1] In related papers, Snyder and Evans (2002) and Engelhardt, Gruber, and Perry (2002) used the notch to examine the effect of income on mortality and living arrangements, respectively.

We carry out this analysis using data from 1967 through 2000 from the March Current Population Survey (CPS). We use these data to form income measures for elderly *households* and *families*. Elderly households are all living units in which an elderly person resides; elderly families consist of an elder and his/her spouse. So if an elderly couple co-resides with their children, they are in the same household, but different families.

We have several findings of interest. First, while there has been a major decline in absolute poverty among elderly households, relative poverty has followed a U-shaped pattern, declining during the rapid growth in Social Security during the 1960s and 1970s, but then rising again in the 1980s and 1990s as benefit growth has fallen behind non-elderly income growth. This raises the important question of whether the elderly should or should not share in the increases in the standard of living realized by the non-elderly. Moreover, the poverty gap among elders, after declining in the 1960s and 1970s, has either flattened (absolutely) or risen (relatively) in the 1980s and 1990s. Income inequality has also exploded among the elderly in the 1990s.

Second, these changes in the income position of low-income elders are fairly similar across age groups, with all age groups following the same basic patterns outlined above. Third, there are important differences in these patterns by marital status group. In particular, the declines in absolute poverty, and U-shaped pattern for relative poverty, that we see in the data are much stronger for married than for unmarried elders.

Fourth, we document a major causal role of Social Security in driving these time-series patterns. Increases in Social Security generosity over time are strongly negatively associated with changes in absolute poverty, relative poverty, and poverty gaps. There is, however, a weak

or positive association with income inequality, suggesting that Social Security is benefiting higher income elders at the same or higher rate that it benefits low income elders over this period.

Finally, we illustrate the critical role of elderly living arrangements in driving these conclusions. The time series provides some hints that living arrangements might matter: relative poverty declines among the elderly are much stronger when measured using families, rather than households, and there are much steeper declines in poverty for single elderly when using families, rather than households. The regression results confirm the importance of living arrangements: the effect of Social Security on poverty is much stronger for families than for households, in particular for widows/widowers and divorcees. This is consistent with the findings of Engelhardt, Gruber and Perry (2002) that higher Social Security benefits cause more independent living among widowed and divorced elders. When those elders move out on their own, they are in the same family, but they become relatively poor households, raising the poverty rate among households. This offsets to some extent the poverty reduction among the elderly from higher benefits.

The paper is organized as follows. The next section describes the CPS data. Section III charts the time-series evolution of elderly income and poverty from 1967-2000. Section IV outlines the primary method used to determine the impact of Social Security in the previous literature and describes the construction of the instrumental variable. Section V discusses the empirical results. There is a brief conclusion.

II. Data Construction

This study uses data from the Current Population Surveys (CPS) of March, 1968 through 2001. Each file is a cross-sectional nationally representative sample of households. To construct our main sample, we first assign families within the CPS. For our purposes, a "family" is defined as the household head, his or her spouse, and any children of the household head who are living in the household and are under the age of 19. This differs from the CPS family definition in that we assume any other member of the household is his/her own family, whereas all individuals related by blood are considered members of the CPS family. Note that there may be more than one "family" in a given CPS "household" (e.g. if there are multiple non-married elderly living together). Our family definition requires consistency in relational measures in the CPS household in the annual surveys. Because of changes in these measures, we were not able to construct our measure of the family prior to the March, 1968 CPS. We use both families and households as our observational unit.

In order to measure outcomes for any age range, for either households or families, we weight the full sample of households/families by the number of persons sharing that household/family in the relevant age range. That is, our estimated poverty rate for 65-69 year old "households" is the poverty rate over all households containing a 65-69 year old, weighted by the number of persons age 65-69 in that household. So these are essentially person-weighted poverty rates.

The questions in the March CPS are about income earned in the previous calendar year, so that even though we use data from the 1968-2001 surveys, the income data refer to 1967-2000. Over time, the CPS has provided more disaggregated questions on income sources, and, for some types of income, has changed the wording of questions. For each year, we used the

most disaggregated income measures to make our poverty measures.[2] We computed poverty measures for our analysis by gross and after-tax (or net) income. We used NBER's TAXSIM calculator to construct measures of family and household federal income taxes paid assuming each family chose to claim the standard deduction. We also calculated federal payroll (FICA) taxes on earnings. Our measure of net income is gross income less federal income and payroll taxes paid.[3] All income measures were deflated into real 2001 dollars using the all-items Consumer Price Index (CPI).

We begin our analysis with the classic absolute poverty measure, whether a family is below the federal poverty line. Specifically, for the household-level analysis, we assigned to each household the poverty threshold for the appropriate household size. Similarly, for the family-level analysis, we assigned to each family the threshold for the appropriate size, treating the family as the "household" in the federal threshold definition. We did not incorporate the age 65 and older adjustments for one- and two-person households built into the federal thresholds, so that we could compare elderly and non-elderly on an equal basis. This absolute measure of poverty has a number of limitations, however. First, it holds standards of living constant, and does not allow for productivity growth. Specifically, in a mechanical sense, if there is any real productivity growth over time, so that real wage growth is positive, then poverty based on the federal threshold likely will fall over time, because this measure only adjusts for inflation, not real earnings growth. Second, it is a knife-edge measure that does not capture the depth of absolute deprivation.

[2] In addition, we constructed poverty measures using a set of more aggregated income measures consistently measured across surveys, and the results of our statistical analysis below did not change.

[3] We assumed the standard deduction because the March supplements did not provide the detail to determine whether the family claimed and the amount of itemized deductions. TAXSIM allows state tax liability calculations starting in 1977, but we did not incorporate state taxes into our analysis. We made no attempt to quantify in-kind transfers received (Smeeding, 1986) into our gross and net income measures.

As an alternative, we define a relative measure of the poverty line: 40 percent of the median income per OECD equivalent of the non-elderly in each calendar year. We adjust both elderly and non-elderly income by the OECD equivalence scale. The relative measure has an important feature. It does not hold living standards constant. Holding real elderly income per equivalent constant, elderly poverty will rise as median non-elderly income rises. This relative measure will yield poverty rates that are more likely to be pro-cyclical, as median income rises and falls over the business cycle.

The potential importance of using this relative measure in addition to the absolute measure is shown in Figure 2. This figure graphs real Social Security expenditures per capita as well as the ratio of Social Security expenditures per capita to mean nonelderly income per capita. The series move in tandem until the mid-1980s, and then there is a precipitous decline in relative Social Security generosity even as benefits continue to rise in real terms.

In addition, we consider three other measures. First, we examine the poverty gap, defined as the average difference between elderly income and the poverty line for the subset of the elderly population below the poverty line. We calculate this for the absolute and relative poverty lines described above. Second, we measure income inequality among the elderly as the 90-10 coefficient of variation (i.e., in each calendar year, the difference in the 90^{th} and 10^{th} elderly OECD equivalent income percentiles normalized by mean elderly income).

In addition, we considered other variants. Specifically, we created alternative measures of the absolute poverty line based on 133, 150, and 200 percent, respectively, of the relative poverty line based on 25 and 50 percent of the non-elderly median income, respectively, and measures based on gross and net income. The results did not differ from those presented below. For the remainder of the analysis, all income measures were based on gross income to be

comparable with the federal poverty thresholds, which are based on gross income. March CPS supplemental sampling weights were used to construct the descriptive statistics given below.

III. Time-Series Evidence

Trends Among All Elderly Households

We begin our time-series analysis by considering trends for all elderly households, before turning to subsets of the elderly. Figure 3 shows the absolute poverty rate for elderly households, replicating the result from Figure 1, but adding as well the trends in poverty for non-elderly households. This figure is rescaled so that elderly and non-elderly poverty can be shown in comparable terms.

During the period of most rapid Social Security growth, during the late 1960s and early 1970s, both elderly and non-elderly poverty are declining. The difference between the elderly and non-elderly emerges in the recession of the elderly 1980s, when non-elderly poverty rose dramatically while elderly poverty rose only slightly, and the recession of the early 1990s, where elderly and non-elderly poverty followed a similar pattern. In the 1990s, the decline in non-elderly poverty was much steeper than the decline in elderly poverty. These findings on the relative cyclicality of poverty highlight the protective role of Social Security for the elderly.

Figure 4 shows the relative poverty rate for the elderly and non-elderly, and it tells a very different story. During the late 1960s and early 1970s, the relative poverty rate of the elderly was falling, just as was the case with absolute poverty. But, after the recession of the early 1980s, relative poverty began to rise again for the elderly, and by 2000 was almost back to its 1967 level. This once again is suggestive of a causal role for Social Security; as Figure 2

showed, Social Security benefits relative to non-elderly income in 2000 were at roughly the same level as in 1967.

Figure 5 extends the analysis to consider the absolute poverty gap. Here, we see a strong decline in the late 1960s and early 1970s for the elderly that is not found for the non-elderly, suggesting a role for Social Security. This gap climbs steadily, however, starting in the early 1980s, and by 2000 is three-quarters of the way back to its 1967 value. Thus, the continued real growth in Social Security after the early 1980s was not sufficient to mitigate the growth in the poverty gap.

Figure 6 models the relative poverty gap. In this case, the elderly and non-elderly series move effectively in tandem. There is no significant decline in the period of rapid program growth of the late 1960s and early 1970s, and a huge rise starting in the early 1980s.

Figure 7 shows the evolution of inequality within the elderly over time. Relative to the non-elderly, inequality among the elderly declined significantly from the late 1960s through the early 1990s. But inequality exploded in the 1990s among the elderly, rising at an even faster rate than inequality among the non-elderly.

Figures 8-12 show these same set of results for elderly families, rather than elderly households. For absolute poverty, in Figure 8, the analysis is similar (although poverty rates are much higher, consistent with the notion that there are economies of scale in shared living conditions). For relative poverty, in Figure 9, there is a major difference; the relative poverty of the elderly doesn't rise in the 1980s and 1990s, but rather stays flat. This finding suggests the potential importance of living arrangements in driving the poverty rates of the elderly. Engelhardt, Gruber and Perry (2002) find, in fact, that benefits increases are strongly positively

associated with an increase in independent living among widowed and divorced elderly. We return to this issue below.

Trends by Age Group

There are dramatic differences in the poverty rates of the "young" and "old" elderly. In 2000, households in which 65-69 year olds resided had a poverty rate of 7.5 percent; households in which elders ages 80 and above resided had a poverty rate that was almost twice as high, at 13%. This raises the question of whether all age groups of elderly have shared equally in these dramatic changes in the income distribution.

Figures 13 and 14 show the absolute and relative poverty rates by age group, at the household level (parallel to figures 3 and 4). In fact, the patterns are remarkably similar across these age groups. In every case we see the steep decline in absolute and relative poverty in the late 1960s and early 1970s, and in every case we see the rise in relative poverty in the 1980s and 1990s. So there is no evidence here of a relatively large effect on one particular age group.

Figure 15 shows the absolute poverty rates at the family level. What is immediately noticeable here is the high initial levels of poverty for the oldest age groups. For those over age 80, the poverty rate was 70% in 1967, and has fallen by over 75% since. Indeed, Figure 15 shows that there is a noticeable compression in absolute poverty rates of the elderly at the family level, with the largest drops for the oldest elderly. This once again emphasizes the role of living arrangements.

Trends by Marital Status

Another important source of dispersion in poverty rates among the elderly is marital status. At the household level, the poverty rate of married elders in 2000 was only 5%; for never married elders, it was almost 22%. For divorced and widowed elders, it was 16-17%.

Figures 16-21 investigate differences in the evolution of income by marital status, for elderly households. In interpreting these figures, it is important to recognize that the composition of each group is changing over time. While the number of married or widowed elders rises by 50% from 1967 to 2000, the number of divorced elders rises by almost 500%, and the number of never married elders rises by over 300%. Thus, patterns in poverty over time could reflect group composition changes.

Given this caveat, the results for changes in poverty by marital status are quite interesting. It appears that the changes over time for all elderly are driven by the married elderly. For both absolute poverty in Figure 16, and relative poverty in Figure 17, the patterns are much stronger for married elderly than for other groups. Particularly striking is the lack of poverty decline for never married elderly, who start out with the second highest poverty rate in 1967 and have the highest rate of these groups by 2000. Similarly, in Figure 18, we show a much larger rise in the absolute poverty gap for the married elderly than for other groups. Figures 19 and 20 show no obvious difference across marital group in relative poverty gaps or inequality.

Once again, moving to the family level changes the poverty results somewhat. In Figure 21, where results are graphed at the family level, there is now a much larger reduction in poverty for widows and for the never married. Once again, living arrangements are playing a significant role here.

IV. Identifying the Impact of Social Security

The previous literature on poverty is voluminous, and we do not attempt to review it here.[4] Instead, we focus on the primary method used to measure the impact of public policies on poverty and how that relates to our instrumental variable identification strategy. Following Jantti and Danziger (2000), let i and t index elderly sub-group and calendar year, respectively, F be a function of resources, then $P_{it}[F(y);z]$ is a poverty measure for some income y and poverty line z. In addition, let τ be taxes paid and b Social Security income, so that

$$y = y' + b - \tau, \tag{1}$$

where y' is market capital and labor income. In principle, the impact of Social Security on poverty is

$$\widetilde{\Delta} = P_{it}[\widetilde{F}(y');z] - P_{it}[F(y);z], \tag{2}$$

where $\widetilde{F}$ is the counterfactual distribution of market labor and capital income in the absence of Social Security. In practice, the primary method for analyzing the impact of Social Security on poverty has been to calculate the *actual* difference in poverty using market income and income net of taxes and transfers,

$$\Delta = P_{it}[F(y');z] - P_{it}[F(y);z]. \tag{3}$$

There are three problems with Δ as a measure of the impact of Social Security on poverty. First, it misses is any "crowd out" of real behavior. In particular, observed capital and labor income, y', itself may be a function of benefits, b, if, for example, when faced with an unanticipated and permanent increase in benefits, the elderly leave the labor force earlier, reduce post-retirement hours of labor supplied, increase consumption and reduce saving, or substitute

[4] See Jantti and Danziger (2001), Cowell (2001), and Gottschalk and Smeeding (2001) for comprehensive recent reviews of various aspects of this literature.

independent for shared living arrangements.[5] Second, survey-based measures of income might be subject to reporting error. Third, to the extent that most of the variation in Social Security benefits that identifies Δ is time-series in nature, there may omitted variables that are correlated with changes in poverty rates and Social Security. For example, lifetime earnings, which enter into Social Security benefit calculations, are affected by aggregate productivity and human capital accumulation that have been changing across time. However, because the federal poverty thresholds are inflation-adjusted, but not average earnings adjusted, in a mechanical sense, poverty rates for successive birth cohorts should be predicted to fall as productivity, human capital accumulation, and real lifetime earnings have risen. Thus, what might appear as an inverse correlation between elderly poverty based on absolute measures and Social Security, as in our figures, may simply be due to rising aggregate productivity. That is, even in the absence of Social Security having had a causal impact, elderly poverty would appear to have fallen as benefits rose. This would bias estimates toward finding that Social Security lowered elderly poverty.

Construction of the Instrument

To circumvent these problems we place (3) in a regression framework and construct an instrumental variable for Social Security benefits independent of omitted time-varying factors and based on an exogenous measure of lifetime labor income. The variation in this instrument derives solely from legislative changes in benefits. Specifically, we exploit the exogenous large changes in Social Security benefits documented in the introduction: the enormous run up in benefits for birth cohorts from 1910 through 1916, followed by the striking decline for those

[5] See Feldstein and Liebman (2001) for a comprehensive recent review of studies on labor supply and saving behavior, Sawhill (1988), Hurd (1990), and Danziger, Haveman, and Plotnick (1981) for earlier reviews. Engelhardt, Gruber, and Perry (2002) review the literature on elderly living arrangements.

birth cohorts from 1917 through 1921, due to the Social Security notch from the 1977 Amendments. Over a relatively short period, otherwise similar workers saw enormous unanticipated and permanent swings in their level of Social Security entitlement, allowing us to potentially identify the effects of Social Security independently on poverty.

To construct our instrument, we note that all of the identifying variation from the notch is based on year of birth, and divide the underyling CPS micro data into age-by-calendar year cells, which, of course, are also year-of-birth cells. The year of birth refers to the "Social Security beneficiary," defined as the male person in the family 65 and older. If there is no male 65 and older, the beneficiary is the oldest never-married female in the family. These two groups consist of people most likely to have had Social Security benefits based on their own earnings history, rather than that of their spouse. If there is neither a male nor a never-married female 65 and older, we assign the Social Security beneficiary to be the divorced or widowed female that is 65 and older. We assume that her Social Security benefits are based on the earnings of her former or deceased spouse, assumed to be three years older than her, so that the "age" of beneficiary is the woman's age plus three for the purposes of calculating our instrument.[6]

The instrument is based on the notion that Social Security benefits should be constructed to be identical for each year of birth *except for changes in the benefits law*. To do so, we first assigned an earnings history to the 1916 birth cohort. The *Annual Statistical Supplement* produced by the Social Security Administration each year contains the median Social Security

[6] Three years was the median difference in age between male and female spouses in the 1981 New Beneficiary Survey. An additional factor that influences actual Social Security benefit levels for widows is the age at which the spouse dies (for widows). A widow whose husband dies at a relatively young age will receive less than a widow whose spouse dies at an older age, due to a longer earnings history for the deceased spouse. For a divorcee, the age at which the marriage ends and the duration of the marriage (for divorcees) are also important factors, as divorcees may only claim on their former spouses' earnings histories if the marriage lasted at least 10 years. Because the March survey did not ask the duration of previous marriages for divorcees or the age at death of the spouse for widows, we could not incorporate these factors into the construction of our instrument.

earnings by gender for five-year age groups on a yearly basis for the current year as well as years past. We use median male earnings from these tables. We assigned median earnings at age 22 (from the median earnings for ages 20-24 in 1938), age 27 (from median earnings for ages 25-29 in 1943), etc., in five-year intervals. We then assume a linear trend in earnings in between these five-year intervals. This method is used through age 60, and earnings are assumed to grow with inflation for ages beyond 60. We do not use median earnings for workers over 60 because many of these workers have entered "bridge" jobs, so that the median worker's earnings at these ages may not be representative of workers who have remained in their lifetime jobs through age 65. This generates an earnings history for a median male earner in the cohort born in 1916. We use the *same* earnings profile even when assigning benefits to never married females, because we assume that their earnings profile would more closely resemble that of a male worker than that of the median female worker.[7]

Importantly, we want our instrument to vary only with changes in Social Security benefit rules and do not want to capture changes in earnings profiles due to human capital and productivity changes in cohorts over time. Therefore, we use the earnings history that we constructed for the 1916 cohort for *all* birth cohorts, and simply use the CPI to adjust this earnings profile for inflation for earlier and later cohorts. Thus, all birth cohorts have the same real earnings trajectory over time. By holding lifetime earnings constant by construction, this insures that all of the variation in the instrument comes from variation in the benefit formula due to the law change. We also assume that this prototypical earnings history ends at age 65, so that we do not incorporate any variation across cohorts in average retirement ages.

[7] In separate tabulations in the CPS, the median earnings of never married females are significantly more highly correlated with male earnings than with the earnings of all females.

Our next step is to input the constructed earnings histories into the Social Security Administration's ANYPIA program. This program calculates the monthly benefit at retirement given a date of birth, date of retirement, and earnings history. ANYPIA gives the monthly benefit at the date of retirement, which is the primary insurance amount (PIA). We assign birthdays of June 2 in the particular year of birth and assume that people retire and claim benefits in June of each possible year they could retire. For each year of birth, we calculate benefits for each possible retirement age and then weight the retirement-age-specific benefits by the distribution of claiming ages from the 1985 *Annual Statistical Supplement* to yield a PIA for that year of birth. The same claiming-age weights are applied to each year of birth.[8] Married couples are assigned 150% of this PIA.

The Social Security Administration periodically increases nominal benefits to adjust for inflation. To obtain a value for the predicted benefit for a given age and year-of-birth cohort, we need to account for all "cost of living adjustments" (COLA) until the date of interview. We calculate the median month in which a given age and year-of-birth cell was interviewed, and administer all COLA adjustments from the time that the person would have retired through this date. This produces a predicted (COLA-adjusted) Social Security monthly benefit for each age and year-of-birth cell. We then multiply by 12 to get the predicted annual benefit.

Regression Specification

To examine the effect of Social Security on elderly poverty, we estimate the following basic specification,

$$P_{it} = \delta' \mathbf{X}_{it} + \theta SSIncome_{it} + u_{it} \tag{4}$$

[8] We assume that they claim in June because some cost-of-living (COLA) adjustments were administered in June of a given year, rather than December of a given year. We assume that the beneficiary claims in June so that he will receive any COLA in that year. This prevents variation across years of birth based simply on the timing of the COLA.

where i and t index single year of age and calendar year, respectively. P is one of the five outcome measures outlined in section II above, *SSIncome* is the cell mean reported annual Social Security income, and u is a disturbance term. The parameter θ indicates the change in the outcome measure for a change in Social Security income. $\mathbf{X}$ is a vector of all other explanatory variables. We specify $\delta'\mathbf{X}$ as

$$\delta'\mathbf{X}_{it} = \beta' x_{it} + \sum_{i=65}^{90} \gamma_i D_{it}^{Age\ i} + \sum_{t=1967}^{1999} \alpha_t D_{it}^{Year\ t}, \qquad (5)$$

where x is a vector of demographic variables that includes controls for cell means of educational attainment of the head (high school diploma, some college, and college or advanced degree), marital status (married, widowed, and divorced in the pooled sample) white, and female. By controlling for these cell characteristics, we control for any other trends in cohort characteristics that might be correlated with both the legislative changes in benefits determination and with poverty. Following Krueger and Pischke (1992), we also include in (5) a full set of dummies for the age of the head, $D^{Age\,i}$, and calendar year dummies, $D^{Year\,t}$.[9] The age dummies control for differences across age groups in the outcome measure; the year dummies control for any general time trends in the outcome measure. Thus, after controlling for age and calendar year, the variation in *SSIncome* is based only upon year of birth. When we then instrument with the variable described above, which we denote as B, our model is identified solely by legislative variation in benefits generosity across birth cohorts, and not any differences in their earnings history. The means of the dependent variable and primary explanatory variable are shown in Table 1 for each sample.[10]

[9] The excluded group consists of families with heads' age over 90, observed in calendar year 2000.
[10] Descriptive statistics for all variables and samples are available in an appendix from the authors.

Figure 22 illustrates the variation that identifies this model. In this figure, we graph the simulated instrument by age, over time, for ages 65, 70, 75, and 80. The evolution of benefits over calendar year varies by age; likewise, in any calendar year, there are very different benefits by age group. Thus, we can include both age and year dummies in this model, and identify from this relative evolution in benefit structure by age cohort.

V. Estimation Results

Table 2 shows the grouped OLS and IV estimation results for the full sample that includes all elderly, where the weights were based on the cell sizes. Standard errors are shown in parentheses. Each row shows the estimate of θ for the associated outcome measure. Columns 1 and 2 give the grouped OLS and IV estimates of θ with no other controls, respectively. Column 3 gives the IV estimates with other controls. In columns 1-3, in which the outcome and Social Security measures are in levels, all coefficients are multiplied by 1000 for ease of interpretation; so, the coefficient shows the impact of a real $1000 rise in annual Social Security benefits on the outcome. In column 4, the outcome and the Social Security measures are in logs, so that the coefficients are interpreted as elasticities. Panel A gives estimates for elderly households and Panel B for families.

Using the fraction of elderly households below federal poverty threshold (the head-count ratio) as the dependent variable (row 1, Panel A), a $1000 increase in annual benefits reduces the poverty rate by 2.9 percentage points (column 1). The IV estimates in columns 2 and 3 imply decreases in the poverty rate of 4 and 3.3 percentage points without and with controls, respectively. The IV estimates from the log specification in column 4 imply an elasticity of the poverty rate to Social Security benefits of -0.25, so that if benefits were cut by 10 percent, the

poverty rate would be expected to rise by 2.5 *percent* (not percentage points). Over the 1967-2000 period, the poverty rate fell from 31 percent to 10 percent, or by 21 percentage points, while the simulated Social Security benefit, B, rose by $6000, roughly doubling. Hence, the IV linear estimate in column 3 implies that the increase in Social Security benefit can explain 20 *percent* $(-0.20 = -0.033 \times 6)$ of the 21 percentage point decline in the poverty rate in this period, whereas the IV log estimate in column 4 implies that Social Security can explain a decline of only 7.5 percentage points (or one-quarter of the 1967 poverty rate).

The first row of panel B shows the estimates of θ for the family-level dataset. The results for elderly families are much stronger. In column 4, the estimated elasticity of the poverty rate to Social Security benefits is -1.26, which suggests that a cut in benefits of 10 percent would increase the proportion of elderly families in poverty by 12.6 percent. The IV linear estimate in column 3 implies that the increase in Social Security benefit can explain 54 *percent* $(-0.54 = -0.091 \times 6)$ of the 21 percentage point decline in the poverty rate in this period, whereas the IV log estimate in column 4 implies that Social Security can explain essentially all of the decline.

The second row of Table 2 gives the estimates of θ for the relative poverty rate. Increases in Social Security benefits appear to play a strong causal role in reducing poverty for both the levels and log specifications. Once again, there is a much stronger effect for elderly families than households, a consistent finding throughout the empirical analysis, and one to which we return below.

The third and fourth rows of Table 2 give estimates of the impact of Social Security on the poverty gap for the absolute and relative poverty measures, respectively. Social Security has a strong estimated effect on the absolute poverty gap in both levels and logs, and more so for

elderly families. Like those for the poverty rates, the implied elasticities are economically large and statistically significant. However, the results based on the relative poverty gap (row 4) are much weaker. In particular, Social Security appears to have an economically small ($\hat{\theta} = -0.06$) and statistically insignificant impact on the gap for elderly households. The results are stronger for elderly families.

Finally, the last row of panel A shows the estimated impact of Social Security on our measure of inequality (the 90-10 difference divided by mean income). For elderly households, there is an estimated insignificant reduction in inequality, but for elderly families, there is a significant *increase* in inequality. Overall, the results in Table 2 indicate that Social Security has played a very significant role in reducing elderly poverty, measured as (absolute and relative) rates and gaps. However, it is a fairly blunt instrument: inequality is not falling, and, perhaps, is rising.

The pooled sample used in Table 2 combines households of different marital types, some of which might be expected to display quite different responsiveness of Social Security to poverty. For example, because most married couples live independently (of other adults) and have many potential sources of income with which to support themselves, they may be expected to have relatively low sensitivity of poverty to Social Security *a priori*. On the other hand, widowed individuals may be heavily reliant on Social Security as an income source, and, therefore, be expected to have a much more elastic response.

Tables 3-6 show estimation results for four different sub-samples, split out by marital status. The results are imprecise for those relatively small marital status groups: divorced (Table 4) and never married (Table 6). Married couples appear to have the most elastic poverty response to Social Security, with very large estimated elasticities in Table 3 across the various

outcome measures. The responses of the widowed and divorced are particularly sensitive to the family versus household distinction.

One finding that is consistent across all specifications in our analysis is that the impact of Social Security on poverty is stronger for elderly families than households, and this family versus household distinction is more pronounced for the widowed and divorced. This finding is consistent with Engelhardt, Gruber, and Perry (2002), who examined the impact of Social Security on the proportion of elderly in shared living arrangements, using data from the 1980-2000 March CPS and the Social Security notch for identification. That analysis found that widows were quite sensitive to benefits in their living arrangements, with each 1% rise in benefits found to lead to a 1.3% reduction in the share of widows living with others. In addition, elderly divorcees were even more income elastic in their living arrangements. But those who are never married are less elastic, and those are married are not at all elastic. Overall, averaging across all of these groups, there is a sizeable elasticity of –0.4.

The results from Engelhardt, Gruber, and Perry (2002) can reconcile the family versus household differences in the current analysis. In particular, if higher Social Security benefits make the widowed and divorced more likely to live independently, then this will create more elderly households but keep the number of elderly families the same (because in our definition of family, elderly living alone or in shared arrangements are their own family). In addition, the "new" elderly households will be comparatively poor because they only have elderly in them. Therefore, the endogenous response of living arrangements to benefits will bias downward any estimated poverty improvement among elderly households. This bias is the largest for the widowed and divorced, the two groups Engelhardt, Gruber, and Perry (2002) found to have the most elastic response of living arrangements to benefits.

VI. Conclusion

Like many previous studies, we document a major decline in elderly income poverty from 1967-2000 based on the federal poverty threshold. This decline has been uniform across age groups, but more pronounced for married than non-married elderly. However, this decline is not mirrored when the poverty line is based on elderly income relative to non-elderly income. In particular, the growth of non-elderly income in the late 1980s and the 1990s has been faster than the growth in Social Security income for the elderly, so that relative poverty rates for the elderly have been rising. In fact, Social Security relative to non-elderly income is less generous now than in 1967.

An important contribution of this paper is to lay out an instrumental variable methodology to isolate the causal impact of Social Security on poverty. In particular, we relied on a plausibly exogenous change in benefits, the extreme run-up and then sharp reduction in benefits generosity for the cohorts born in the 1910-1921 period due to the Social Security notch. Our instrumental variable estimation results are consistent with Social Security having had a large causal role in reducing elderly poverty.

References

Cowell, F.A., "Measurement of Inequality," in Anthony B. Atkinson and Francois Bourguignon, eds., *Handbook of Income Distribution, Volume 1* (Amsterdam: Elsevier), 2001, pp. 87-166.

Danziger, Sheldon, Robert Haveman, and Robert Plotnick, "How Income Transfers Affect Work, Savings, and the Income Distribution," *Journal of Economic Literature* 19:3 (1981): 975-1028.

Engelhardt, Gary V., Jonathan Gruber, and Cynthia D. Perry, "Social Security and Elderly Living Arrangements," NBER Working Paper No. 8911.

Feldstein, Martin, and Jeffrey B. Liebman, "Social Security," in Alan J. Auerbach and Martin Feldstein, eds., *Handbook of Public Economics, Volume 4* (Amsterdam: Elsevier), 2001, pp. 309-378.

Gottschalk, Peter, and Timothy Smeeding, "Empirical Evidence on Income Inequality in Industrialized Countries," in Anthony B. Atkinson and Francois Bourguignon, eds., *Handbook of Income Distribution, Volume 1* (Amsterdam: Elsevier), 2002, pp. 2246-2324.

Hurd, Michael D., "Research on the Elderly: Economic Status, Retirement, and Consumption," *Journal of Economic Perspectives*, 28:2 (1990): 565-637.

Jantti, Markus, and Sheldon Danziger, "Income Poverty in Advanced Countries," in Anthony B. Atkinson and Francois Bourguignon, eds., *Handbook of Income Distribution, Volume 1* (Amsterdam: Elsevier), 2001, pp. 309-378.

Krueger, Alan, and Jörn-Steffen Pischke (1992). "The Effect of Social Security on Labor Supply: A Cohort Analysis of the Notch Generation," *Journal of Labor Economics*, 10, 412-437.

Sawhill, Isabel V., "Poverty in the U.S.: Why Is It So Persistent?," *Journal of Economic Literatur*e 26:3 (1988): 1073-1119.

Smeeding, Timothy, "Nonmoney Income and the Elderly: The Case of the 'Tweeners," *Journal of Policy Analysis and Management* (1986): 707-724.

Smolensky, Eugene, Sheldon Danziger, and Peter Gottschalk, "The Declining Significance of Age in the United States: Trends in the Well-Being of Children and the Elderly Since 1939," in John L. Palmer, Timothy Smeeding, Barbara Boyle Torrey, eds., *The Vulnerable* (Washington, DC: Urban Institute Press), 1988.

Snyder, Stephen E., and William N. Evans (2002). "The Impact of Income on Mortality: Evidence from the Social Security Notch," NBER Working Paper No. 9197.

United States Social Security Administration, Various Years. *Social Security Bulletin Annual Statistical Supplement* (Washington, D.C.: United States Social Security Administration).

Table 1. Sample Means for Selected Variables, by Marital Status, for All Elderly Households and Families, 1967-2000, from the March CPS (Standard Deviations in Parentheses)

	(1)	(2)	(3)	(4)	(5)
			Marital Status		
Variable	Pooled	Married	Divorced	Widowed	Never Married
A. Households with Elderly					
Absolute	0.193	0.130	0.288	0.242	0.238
Poverty Line	(0.089)	(0.115)	(0.136)	(0.081)	(0.126)
Relative Poverty Line	0.263	0.235	0.384	0.285	0.298
	(0.087)	(0.125)	(0.137)	(0.074)	(0.125)
Poverty Gap Based on	3281	3657	2899	2905	3347
Absolute Line	(798)	(1209)	(1208)	(763)	(1524)
Poverty Gap Based on	2045	2073	2211	2012	2234
Relative Line	(536)	(716)	(950)	(578)	(1218)
90-10 Coefficient of Variation	1.563	1.520	1.675	1.597	1.707
Normalized by Mean Income	(0.234)	(0.272)	(0.529)	(0.258)	(0.481)
Real Social Security Income	6.565	7.229	5.611	6.298	6.328
Per OECD Equivalent	(1.868)	(1.747)	(1.949)	(1.937)	(2.084)
B. Families with Elderly					
Absolute	0.313	0.152	0.403	0.403	0.364
Poverty Line	(0.190)	(0.130)	(0.177)	(0.178)	(0.151)
Relative Poverty Line	0.364	0.274	0.468	0.411	0.371
	(0.157)	(0.140)	(0.158)	(0.143)	(0.137)
Poverty Gap Based on	3390	3688	3055	3039	3551
Absolute Line	(709)	(1177)	(1063)	(638)	(1177)
Poverty Gap Based on	2295	2283	2542	2282	2607
Relative Line	(481)	(708)	(946)	(543)	(1138)
90-10 Coefficient of Variation	1.549	1.528	1.759	1.577	1.821
Normalized by Mean Income	(0.265)	(0.310)	(0.605)	(0.301)	(0.496)
Real Social Security Income	7.023	7.499	6.027	6.969	6.523
Per OECD Equivalent	(1.803)	(1.703)	(1.947)	(1.844)	(2.080)
Instrument	10.203	10.746	11.493	10.225	11.323
	(3.593)	(3.254)	(2.665)	(3.581)	(2.913)
Number of Observations	1096	994	842	1092	834

Note: This table shows single-year-of-age-by-year cell means for selected variables. Standard deviations are in parentheses. Income is measured in thousands of 2001 dollars (deflated by the all-items CPI).

Table 2. Parameter Estimates of the Effect of Social Security on Elderly Poverty Outcome Measures, for All Elderly Households and Families, 1967-2000, from the March CPS (Standard Errors in Parentheses)

	(1)	(2)	(3)	(4)
	Estimator			
Outcome Measure	OLS	IV	IV with Controls	IV in logs, with Controls
A. Households with Elderly				
Absolute Poverty Line	-0.029	-0.040	-0.033	-0.254
	(0.002)	(0.003)	(0.003)	(0.119)
Relative Poverty Line	-0.016	-0.016	-0.021	-0.553
	(0.002)	(0.003)	(0.004)	(0.095)
Poverty Gap Based on Absolute Line	-195	-182	-291	-0.75
	(41)	(60)	(83)	(0.15)
Poverty Gap Based on Relative Line	-55	-43	-70	-0.063
	(23)	(34)	(47)	(0.147)
90-10 Coefficient of Variation Normalized by Mean Income	-0.006	-0.024	-0.012	-0.060
	(0.007)	(0.011)	(0.015)	(0.061)
B. Families with Elderly				
Absolute Poverty Line	-0.082	-0.109	-0.091	-1.26
	(0.003)	(0.005)	(0.005)	(0.141)
Relative Poverty Line	-0.060	-0.073	-0.068	-1.30
	(0.003)	(0.004)	(0.005)	(0.118)
Poverty Gap Based on Absolute Line	-315	-283	-352	-1.13
	(41)	(61)	(79)	(0.178)
Poverty Gap Based on Relative Line	-134	-82	-132	-0.548
	(25)	(38)	(50)	(0.162)
90-10 Coefficient of Variation Normalized by Mean Income	0.047	0.054	0.061	0.458
	(0.009)	(0.014)	(0.018)	(0.098)
Number of Observations	1096	1096	1096	1096

Note: The dependent variable for each regression is the outcome measure shown in the left-hand column. The table shows the grouped OLS and IV parameter estimates of the effect of Social Security income on the outcome measure on the sample of 1096 elderly single-year-of-age-by-year cells. Standard errors are in parentheses. All estimation was weighted by the cell size. Income is measured in thousands of 2001 dollars (deflated by the all-items CPI). All specifications include dummy variables for single years of age from 65 to 90 and calendar years 1967-1999. The specifications in columns (3) and (4) also include controls for the fraction in the cell female, white, in each of four educational attainment and marital status categories, respectively, as described in the text.

Table 3. Parameter Estimates of the Effect of Social Security on Elderly Poverty Outcome Measures, for Married Elderly Households and Families, 1967-2000, from the March CPS (Standard Errors in Parentheses)

	(1)	(2)	(3)	(4)
	Estimator			
Outcome Measure	OLS	IV	IV with Controls	IV in logs, with Controls
A. Households with Elderly				
Absolute Poverty Line	-0.027	-0.048	-0.045	-4.264
	(0.002)	(0.004)	(0.004)	(.885)
Relative Poverty Line	-0.027	-0.030	-0.031	-2.598
	(0.003)	(0.004)	(0.005)	(0.510)
Poverty Gap Based on Absolute Line	28	-15	-10	-0.189
	(77)	(133)	(147)	(.660)
Poverty Gap Based on Relative Line	12	51	61	1.195
	(38)	(65)	(72)	(0.590)
90-10 Coefficient of Variation Normalized by Mean Income	-0.013	-0.066	-0.027	-0.189
	(0.012)	(0.020)	(0.022)	(0.223)
B. Families with Elderly				
Absolute Poverty Line	-0.032	-0.057	-0.055	-5.758
	(0.002)	(0.004)	(0.005)	(1.194)
Relative Poverty Line	-0.032	-0.046	-0.046	-3.285
	(0.003)	(0.005)	(0.005)	(0.680)
Poverty Gap Based on Absolute Line	-10	40	-13	-0.364
	(72)	(124)	(138)	(0.715)
Poverty Gap Based on Relative Line	-3	54	49	0.708
	(37)	(64)	(72)	(0.599)
90-10 Coefficient of Variation Normalized by Mean Income	-0.021	-0.049	-0.011	0.130
	(0.012)	(0.021)	(0.023)	(0.287)
Number of Observations	994	994	994	994

Note: The dependent variable for each regression is the outcome measure shown in the left-hand column. The table shows the grouped OLS and IV parameter estimates of the effect of Social Security income on the outcome measure on the sample of 994 married elderly single-year-of-age-by-year cells. Standard errors are in parentheses. All estimation was weighted by the cell size. Income is measured in thousands of 2001 dollars (deflated by the all-items CPI). All specifications include dummy variables for single years of age from 65 to 90 and calendar years 1967-1999. The specifications in columns (3) and (4) also include controls for the fraction in the cell female, white, in each of four educational attainment categories as described in the text.

Table 4. Parameter Estimates of the Effect of Social Security on Elderly Poverty Outcome Measures, for Divorced Elderly Households and Families, 1967-2000, from the March CPS (Standard Errors in Parentheses)

	(1)	(2)	(3)	(4)
	Estimator			
Outcome Measure	OLS	IV	IV with Controls	IV in logs, with Controls
A. Households with Elderly				
Absolute Poverty Line	-0.022	-0.063	-0.063	-1.883
	(0.003)	(0.026)	(0.026)	(1.989)
Relative Poverty Line	-0.031	-0.013	-0.004	0.836
	(0.003)	(0.027)	(0.026)	(1.603)
Poverty Gap Based on Absolute Line	-136	50	-12	0.414
	(41)	(317)	(314)	(1.885)
Poverty Gap Based on Relative Line	-125	8	71	2.328
	(31)	(236)	(238)	(2.808)
90-10 Coefficient of Variation Normalized by Mean Income	-0.026	0.081	0.125	3.215
	(0.016)	(0.122)	(0.124)	(2.874)
B. Families with Elderly				
Absolute Poverty Line	-0.036	-0.094	-0.083	-2.498
	(0.003)	(0.032)	(0.029)	(3.342)
Relative Poverty Line	-0.041	-0.048	-0.039	-0.013
	(0.003)	(0.028)	(0.026)	(1.777)
Poverty Gap Based on Absolute Line	-174	-39	-68	-1.945
	(34)	(286)	(278)	(3.231)
Poverty Gap Based on Relative Line	-141	64	85	0.380
	(30)	(255)	(250)	(2.771)
90-10 Coefficient of Variation Normalized by Mean Income	0.028	0.245	0.280	7.811
	(0.017)	(0.164)	(0.163)	(10.554)
Number of Observations	842	842	842	842

Note: The dependent variable for each regression is the outcome measure shown in the left-hand column. The table shows the grouped OLS and IV parameter estimates of the effect of Social Security income on the outcome measure on the sample of 842 divorced elderly single-year-of-age-by-year cells. Standard errors are in parentheses. All estimation was weighted by the cell size. Income is measured in thousands of 2001 dollars (deflated by the all-items CPI). All specifications include dummy variables for single years of age from 65 to 90 and calendar years 1967-1999. The specifications in columns (3) and (4) also include controls for the fraction in the cell female, white, in each of four educational attainment categories as described in the text.

Table 5. Parameter Estimates of the Effect of Social Security on Elderly Poverty Outcome Measures, for Widowed Elderly Households and Families, 1967-2000, from the March CPS (Standard Errors in Parentheses)

	(1)	(2)	(3)	(4)
	Estimator			
Outcome Measure	OLS	IV	IV with Controls	IV in logs, with Controls
A. Households with Elderly				
Absolute Poverty Line	-0.018	-0.021	-0.024	-0.061
	(0.002)	(0.005)	(0.005)	(0.134)
Relative Poverty Line	-0.022	-0.013	-0.016	-0.381
	(0.002)	(0.005)	(0.006)	(0.117)
Poverty Gap Based on Absolute Line	-232	-141	-151	-0.440
	(33)	(68)	(79)	(0.145)
Poverty Gap Based on Relative Line	-85	-25	-34	-0.024
	(28)	(58)	(68)	(0.185)
90-10 Coefficient of Variation Normalized by Mean Income	-0.034	-0.042	-0.043	-0.169
	(0.010)	(0.020)	(0.023)	(0.079)
B. Families with Elderly				
Absolute Poverty Line	-0.065	-0.098	-0.102	-1.104
	(0.003)	(0.006)	(0.007)	(0.122)
Relative Poverty Line	-0.058	-0.076	-0.084	-1.077
	(0.003)	(0.006)	(0.007)	(0.118)
Poverty Gap Based on Absolute Line	-322	-290	-308	-0.901
	(25)	(55)	(63)	(0.130)
Poverty Gap Based on Relative Line	-185	-69	-72	-0.280
	(28)	(63)	(72)	(0.189)
90-10 Coefficient of Variation Normalized by Mean Income	0.029	0.098	0.119	0.624
	(0.012)	(0.027)	(0.032)	(0.127)
Number of Observations	1092	1092	1092	1092

Note: The dependent variable for each regression is the outcome measure shown in the left-hand column. The table shows the grouped OLS and IV parameter estimates of the effect of Social Security income on the outcome measure on the sample of 1092 widowed elderly single-year-of-age-by-year cells. Standard errors are in parentheses. All estimation was weighted by the cell size. Income is measured in thousands of 2001 dollars (deflated by the all-items CPI). All specifications include dummy variables for single years of age from 65 to 90 and calendar years 1967-1999. The specifications in columns (3) and (4) also include controls for the fraction in the cell female, white, in each of four educational attainment categories as described in the text.

Table 6. Parameter Estimates of the Effect of Social Security on Elderly Poverty Outcome Measures, for Never Married Elderly Households and Families, 1967-2000, from the March CPS (Standard Errors in Parentheses)

	(1)	(2)	(3)	(4)
	Estimator			
Outcome Measure	OLS	IV	IV with Controls	IV in logs, with Controls
A. Households with Elderly				
Absolute	-0.023	-0.045	-0.053	-2.023
Poverty Line	(0.003)	(0.024)	(0.037)	(1.143)
Relative Poverty Line	-0.030	-0.041	-0.039	-2.049
	(0.003)	(0.024)	(0.036)	(0.889)
Poverty Gap Based on Absolute	-244	-9	7	-0.002
Line	(46)	(375)	(582)	(0.917)
Poverty Gap Based on Relative	-168	-25	-35	-0.399
Line	(38)	(307)	(470)	(1.303)
90-10 Coefficient of Variation	-0.017	0.152	0.254	1.007
Normalized by Mean Income	(0.003)	(0.123)	(0.210)	(0.656)
B. Families with Elderly				
Absolute	-0.034	-0.042	-0.041	-0.457
Poverty Line	(0.003)	(0.020)	(0.026)	(0.481)
Relative Poverty Line	-0.035	-0.039	-0.040	-0.891
	(0.003)	(0.019)	(0.026)	(0.414)
Poverty Gap Based on Absolute	-223	-269	-309	-0.782
Line	(33)	(209)	(290)	(0.445)
Poverty Gap Based on Relative	-169	52	93	-0.454
Line	(34)	(222)	(309)	(0.636)
90-10 Coefficient of Variation	-0.026	0.209	0.314	1.06
Normalized by Mean Income	(0.014)	(0.107)	(0.165)	(0.467)
Number of Observations	834	834	834	834

Note: The dependent variable for each regression is the outcome measure shown in the left-hand column. The table shows the grouped OLS and IV parameter estimates of the effect of Social Security income on the outcome measure on the sample of 834 never married elderly single-year-of-age-by-year cells. Standard errors are in parentheses. All estimation was weighted by the cell size. Income is measured in thousands of 2001 dollars (deflated by the all-items CPI). All specifications include dummy variables for single years of age from 65 to 90 and calendar years 1967-1999. The specifications in columns (3) and (4) also include controls for the fraction in the cell female, white, in each of four educational attainment categories as described in the text.

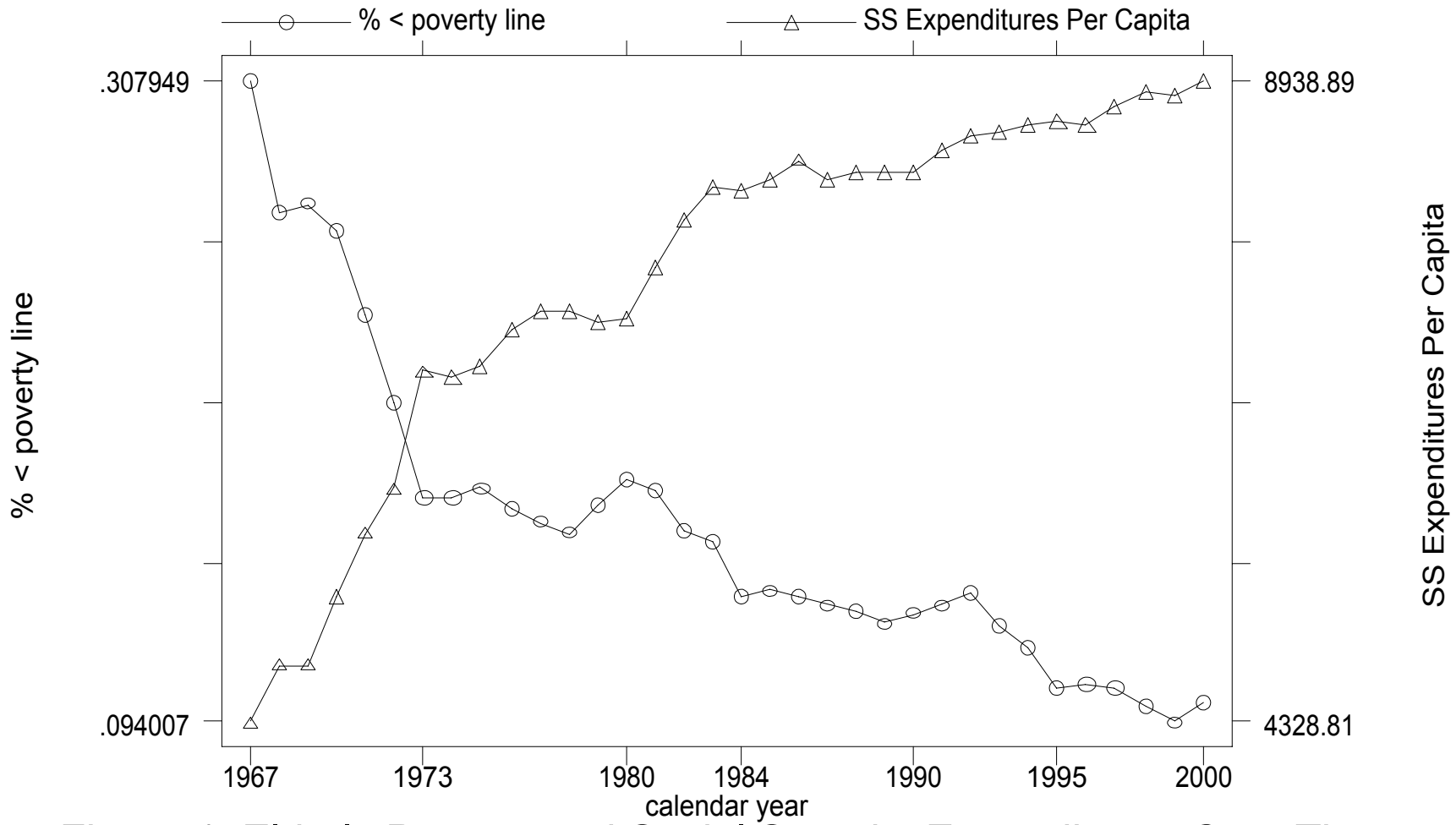

Figure 1: Elderly Poverty and Social Security Expenditures Over Time

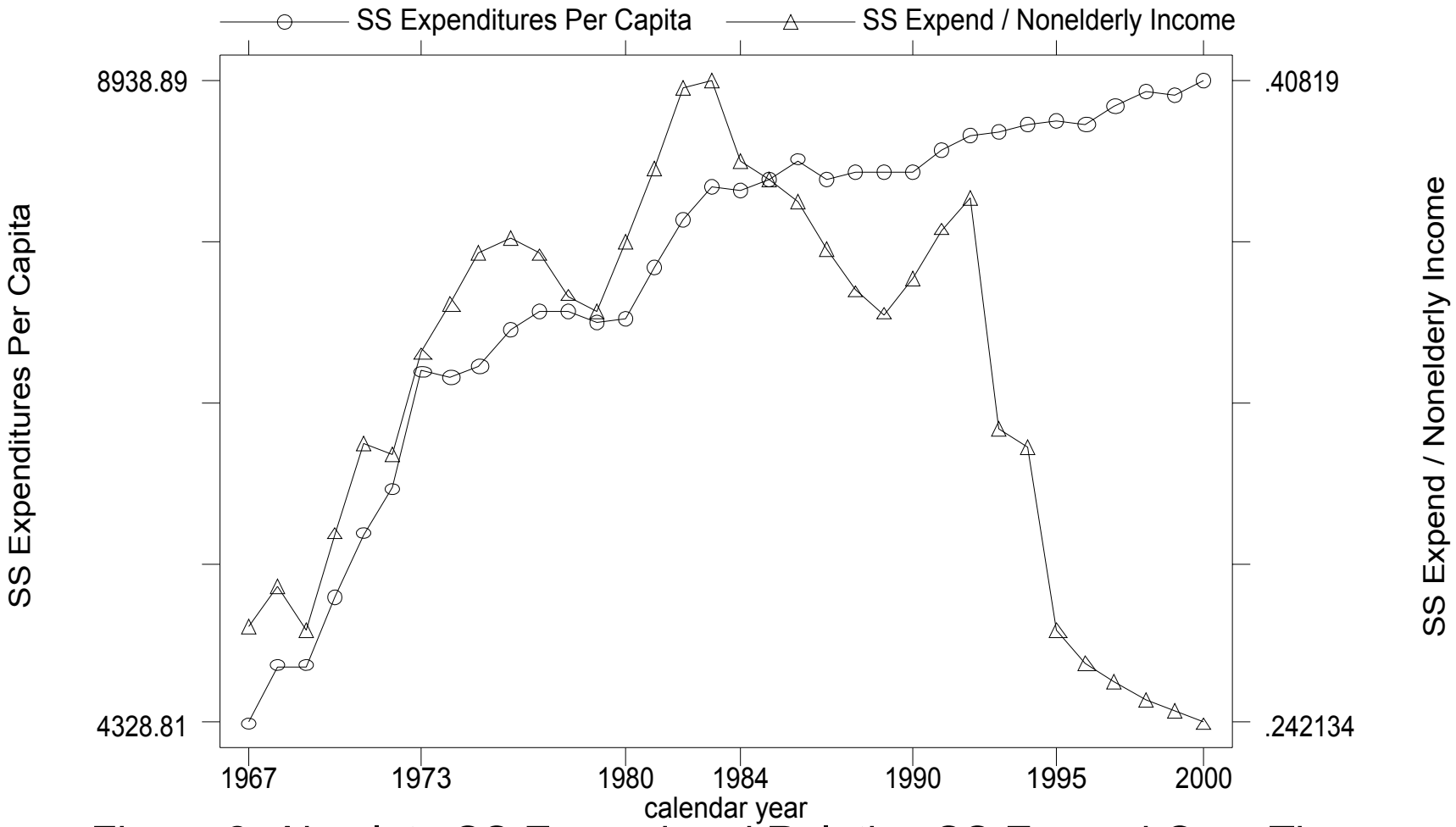

Figure 2: Absolute SS Expend and Relative SS Expend Over Time

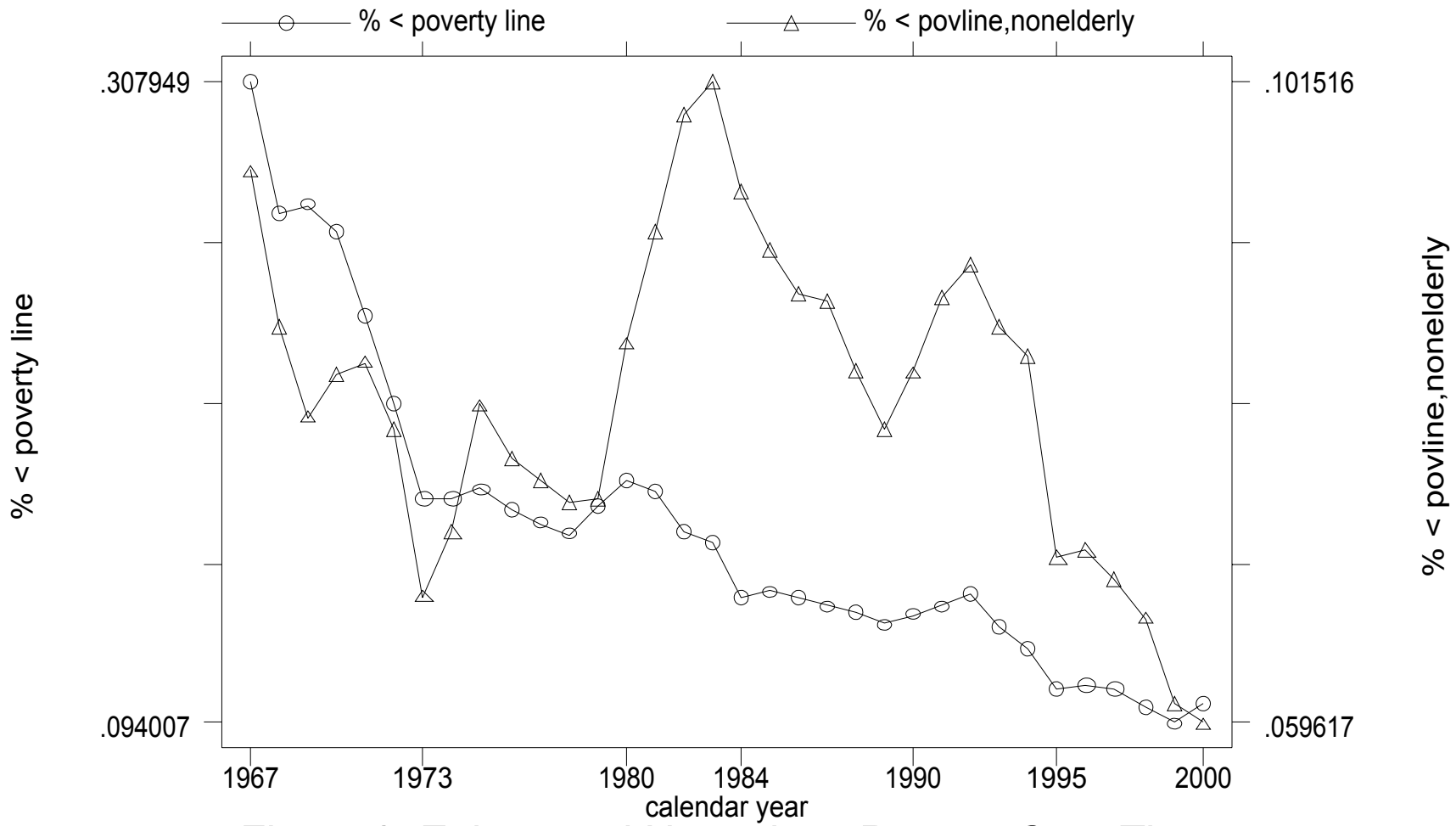

Figure 3: Elderly and Nonelderly Poverty Over Time

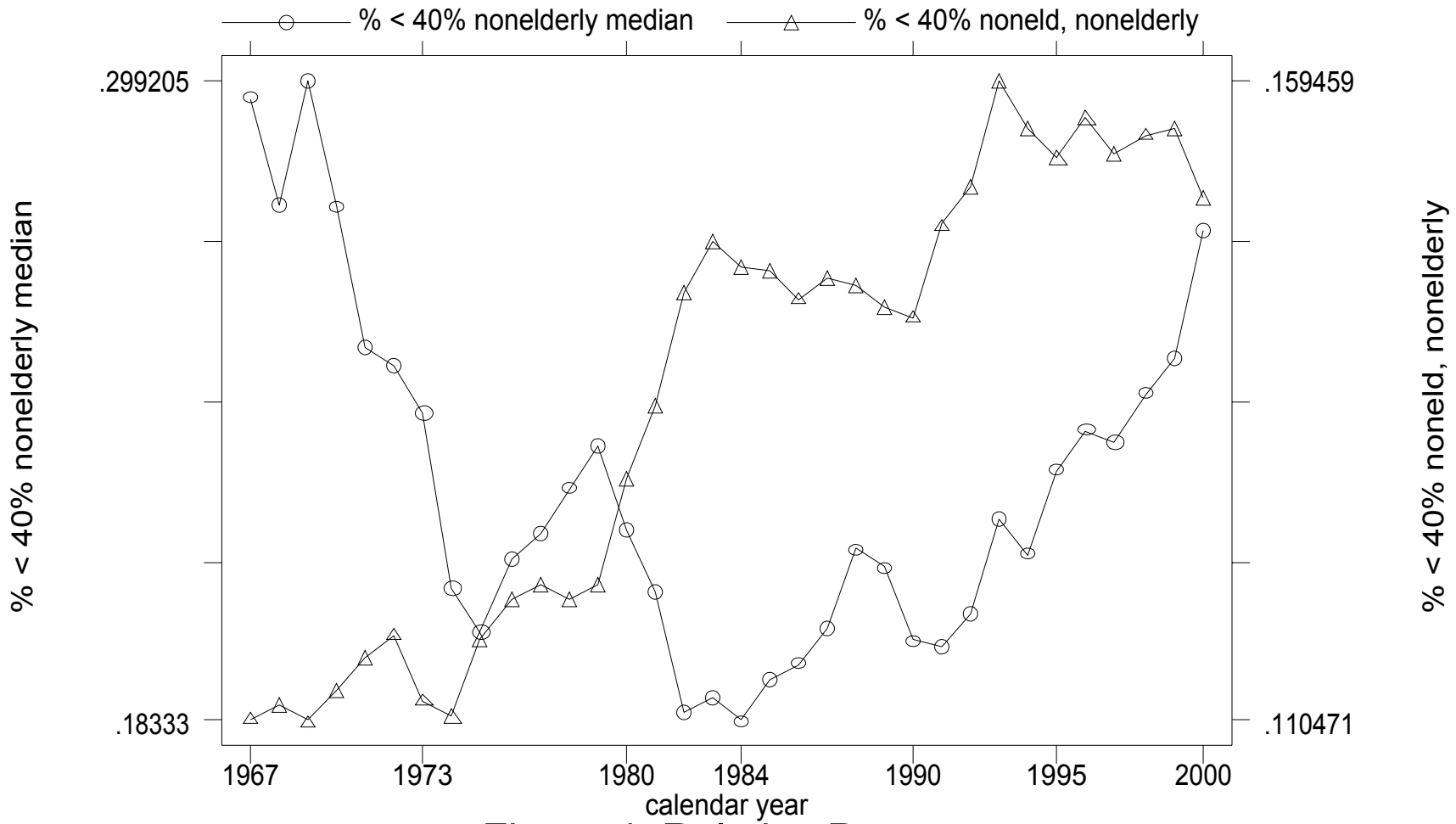

Figure 4: Relative Poverty

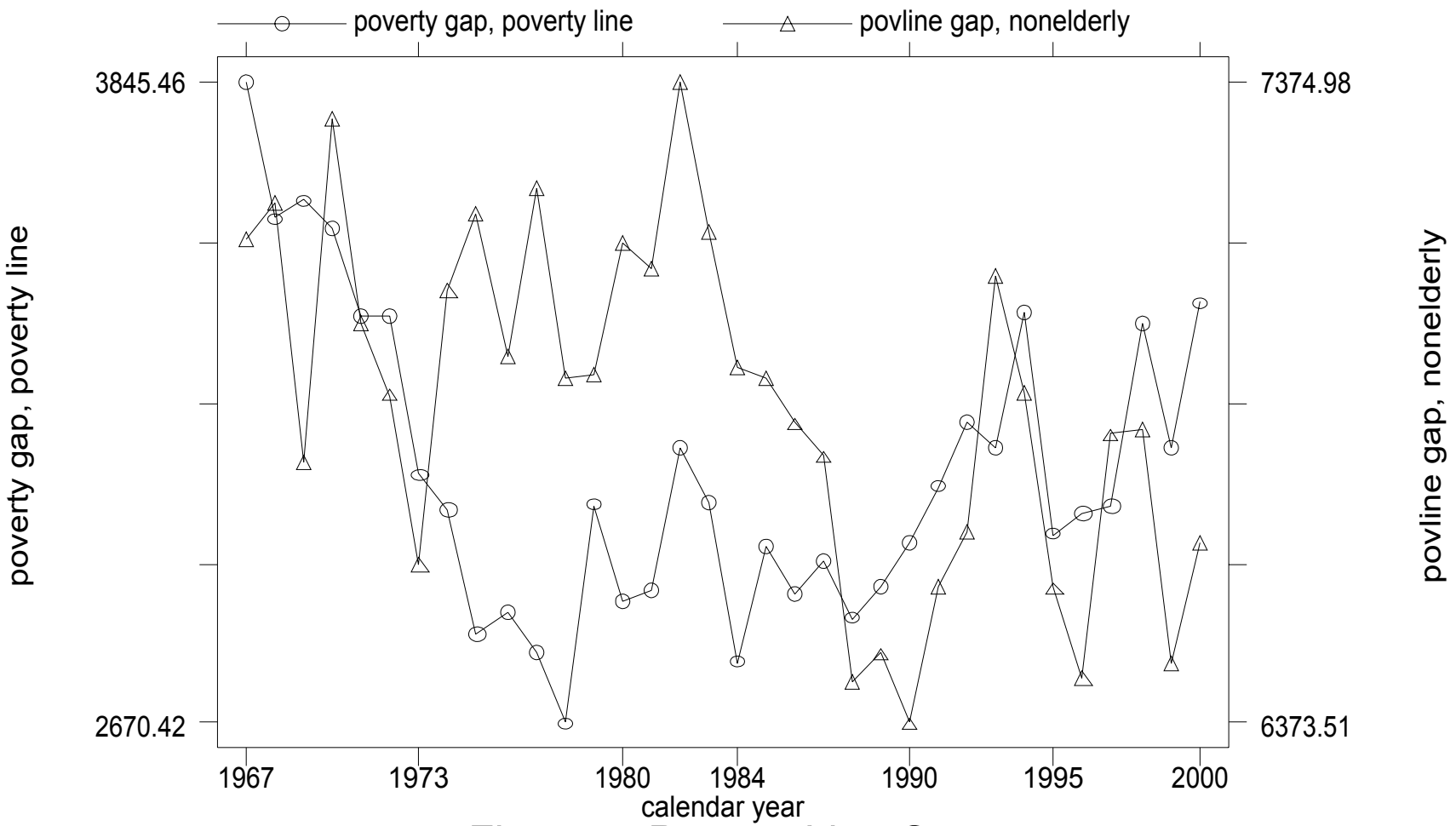

Figure 5: Poverty Line Gap

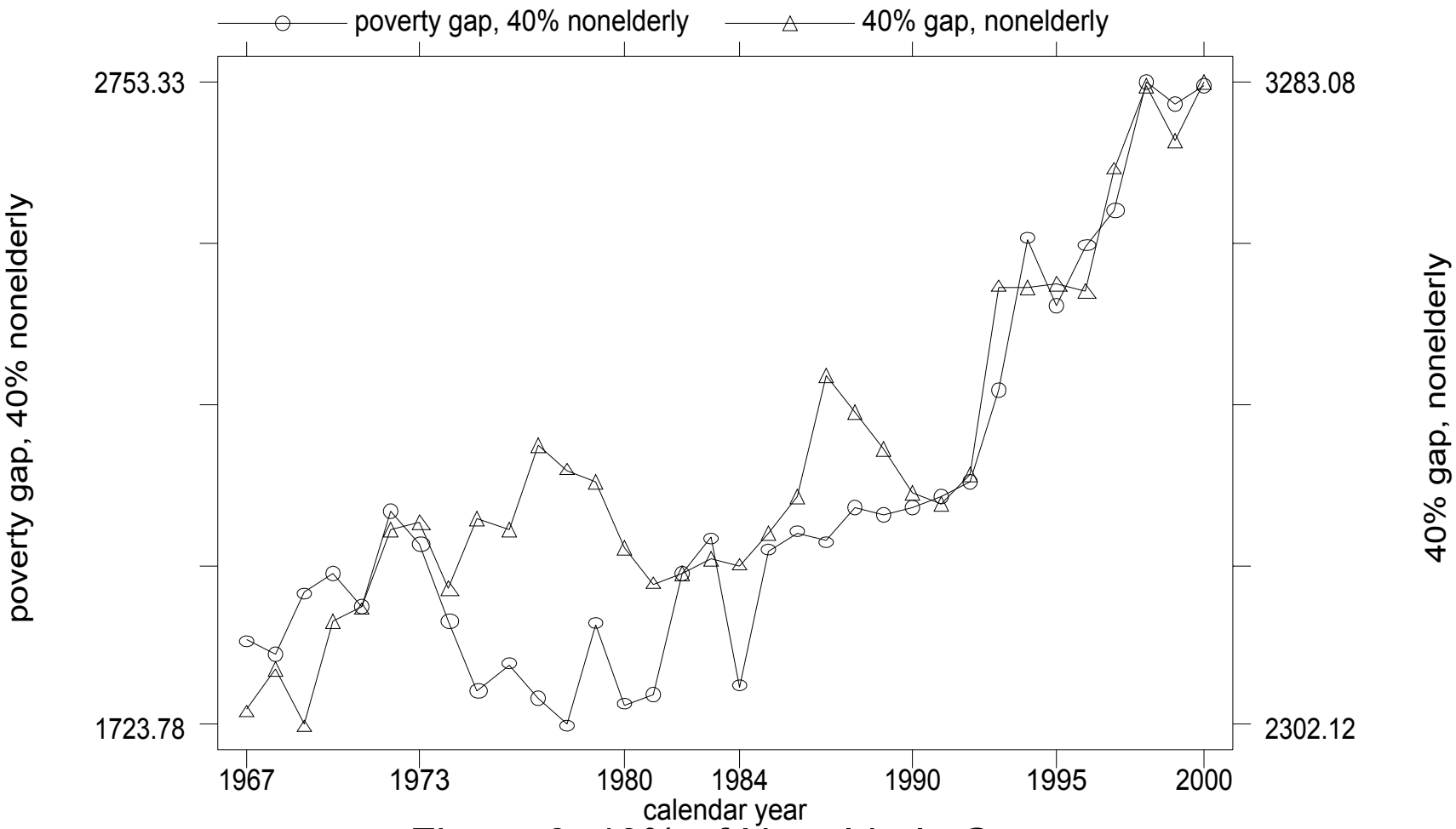

Figure 6: 40% of Nonelderly Gap

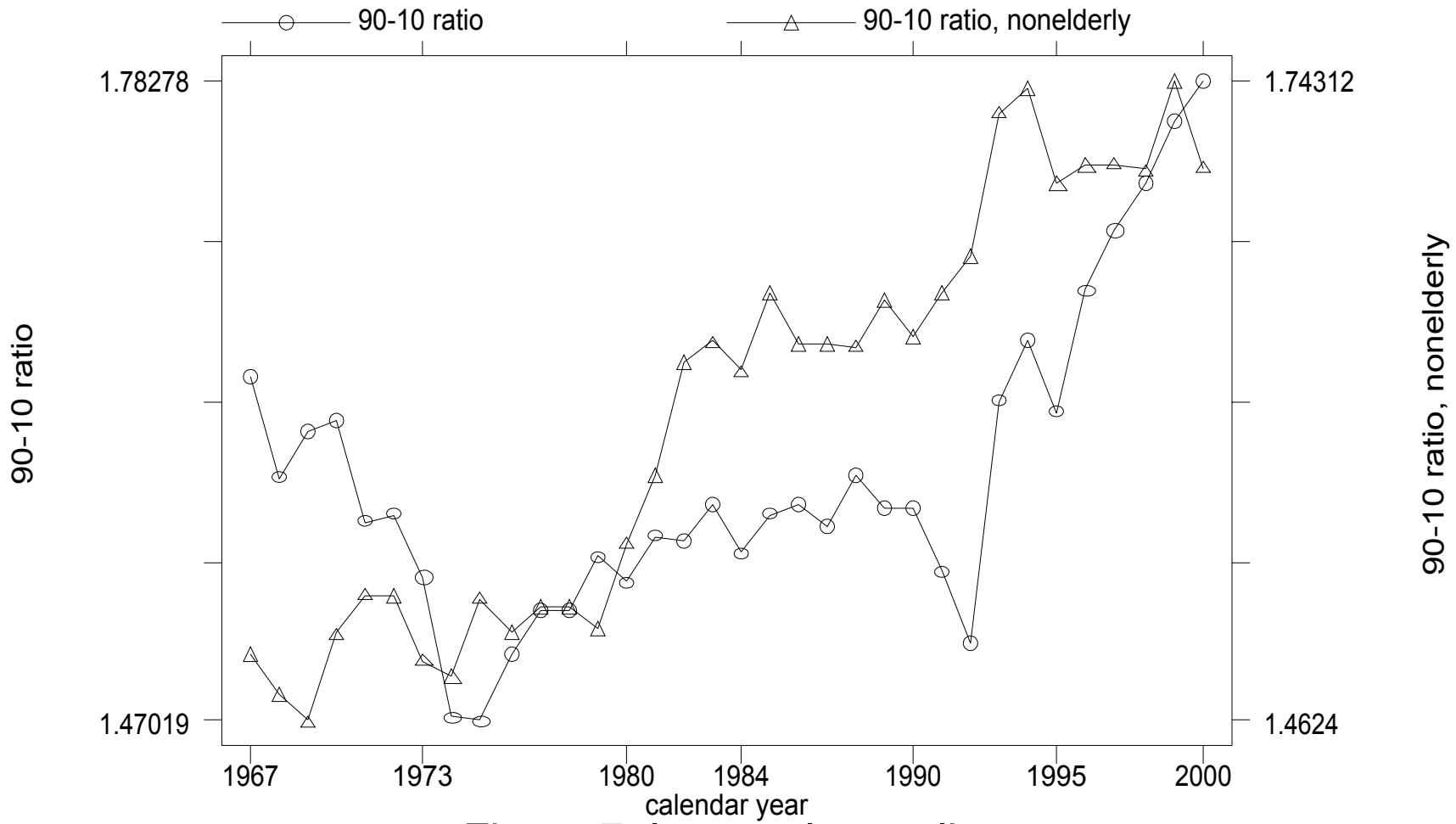

Figure 7: Income Inequality

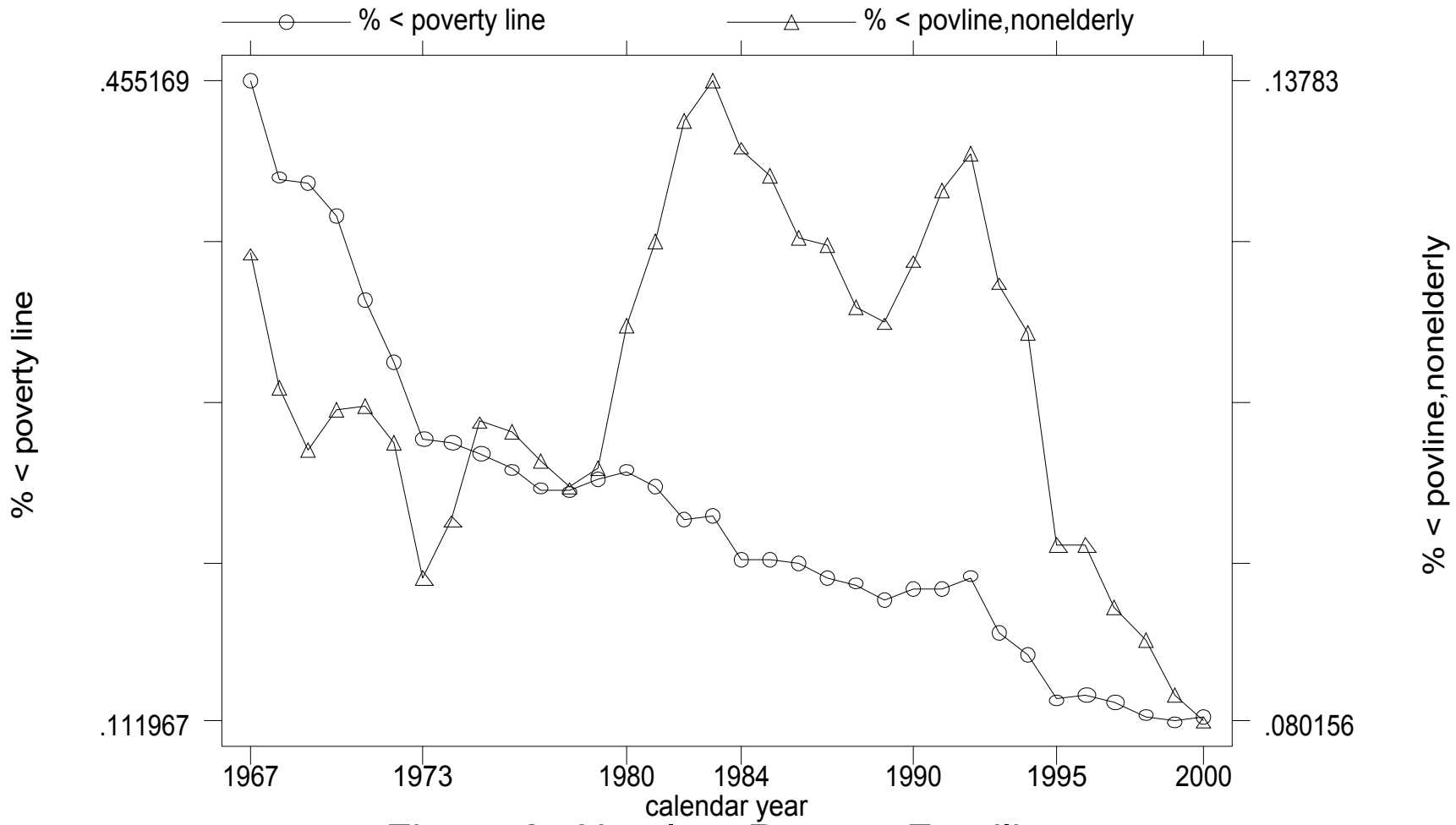

Figure 8: Absolute Poverty,Families

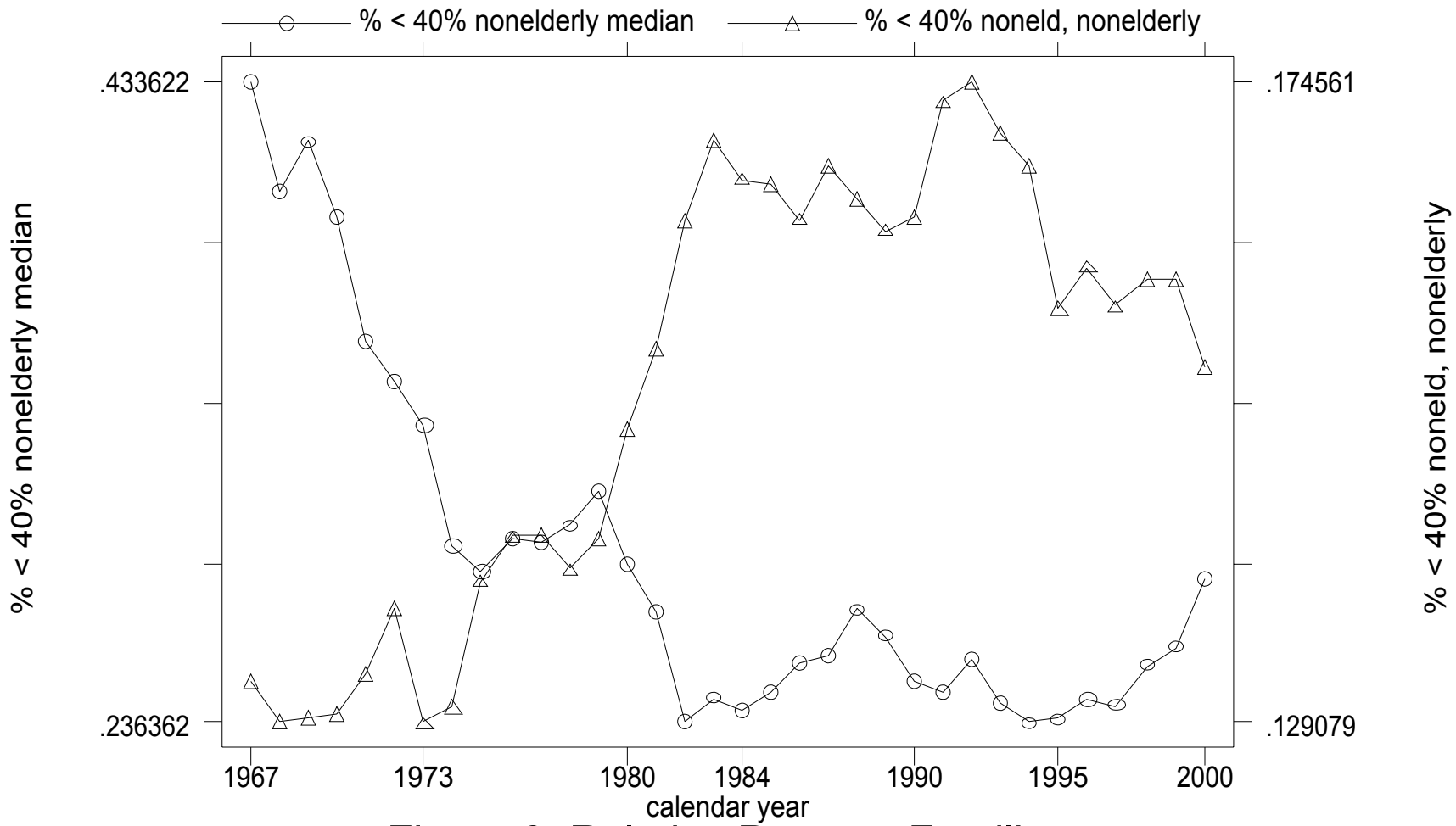

Figure 9: Relative Poverty, Families

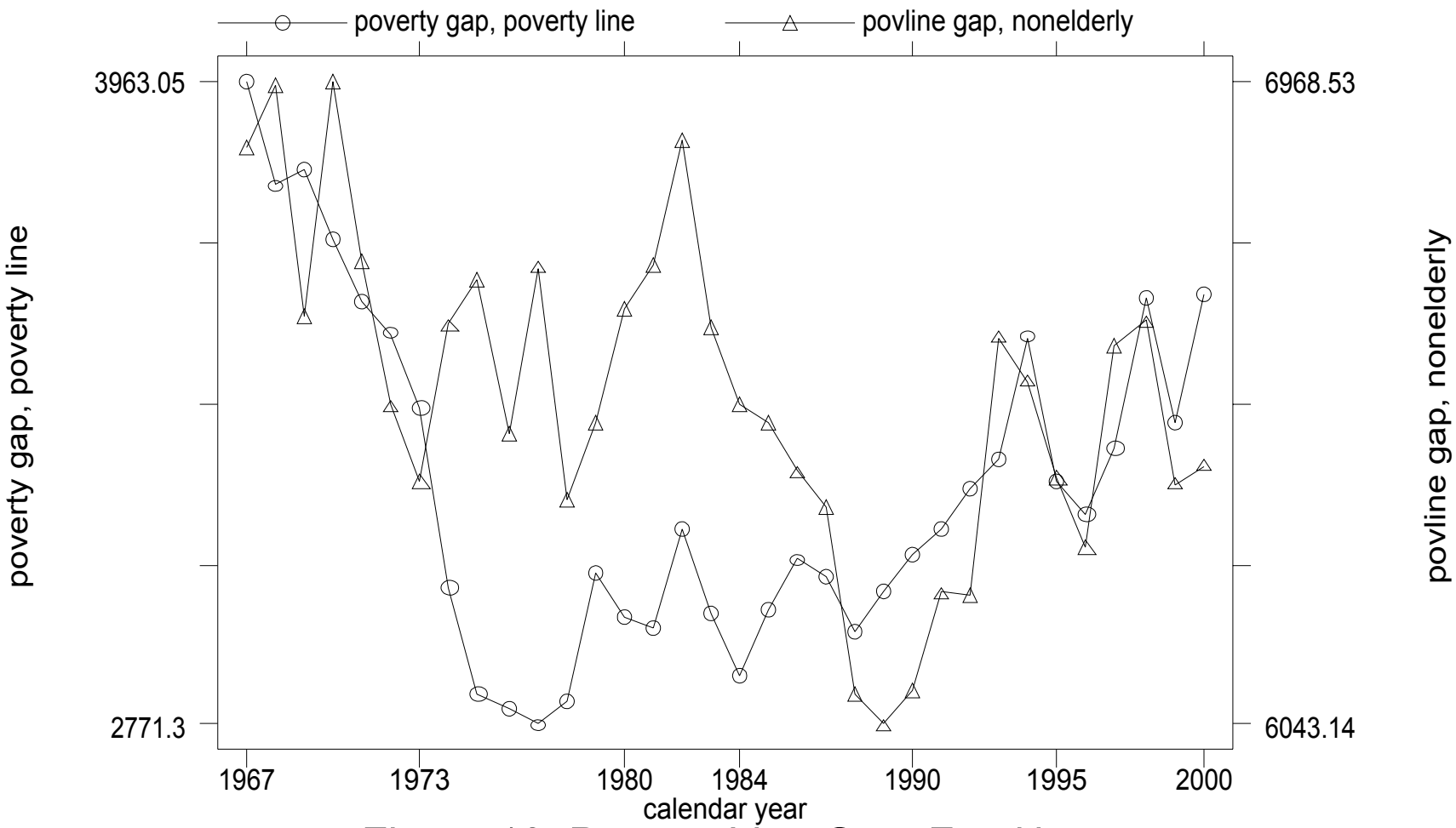

Figure 10: Poverty Line Gap, Families

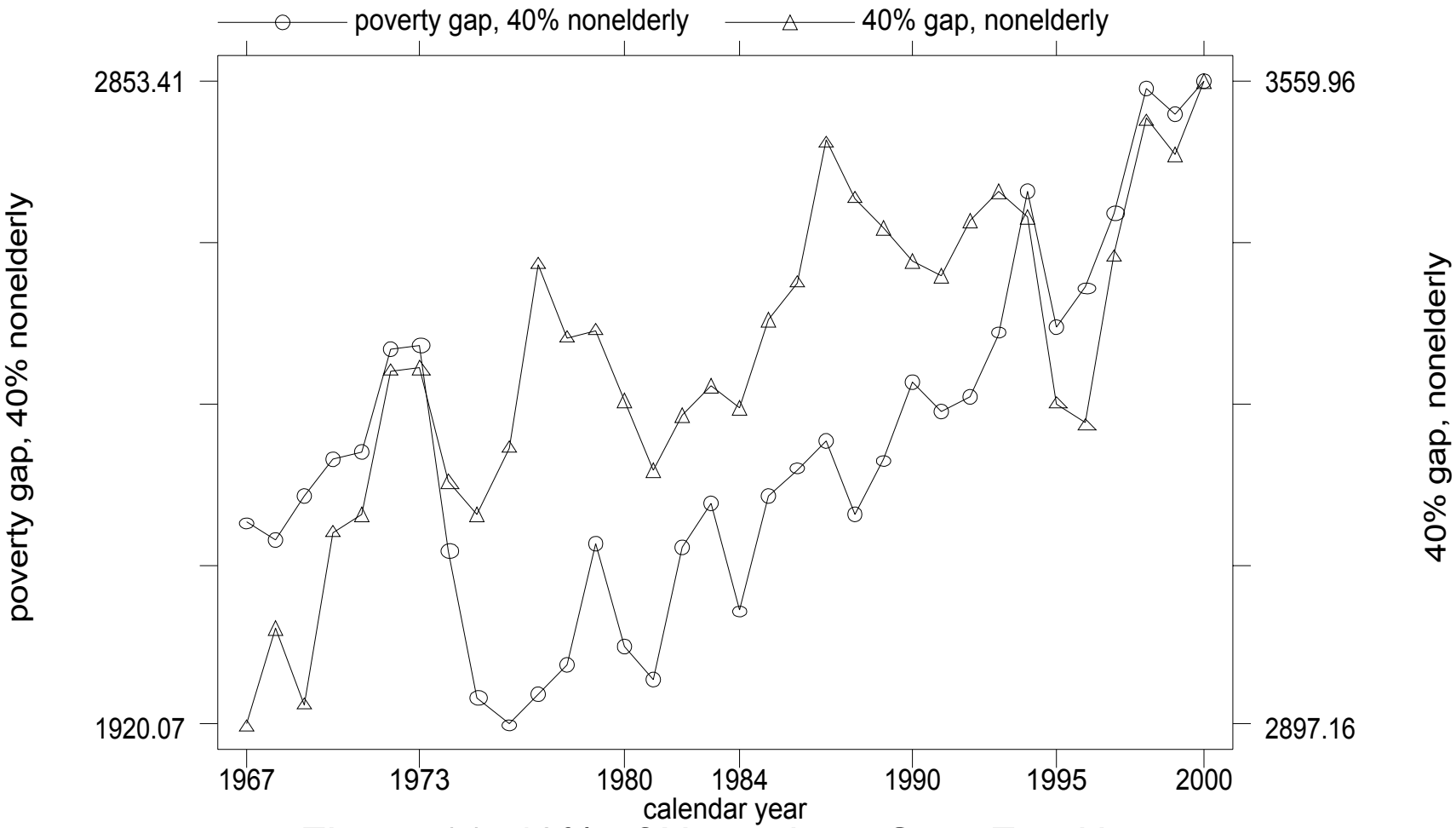

Figure 11: 40% of Nonelderly Gap, Families

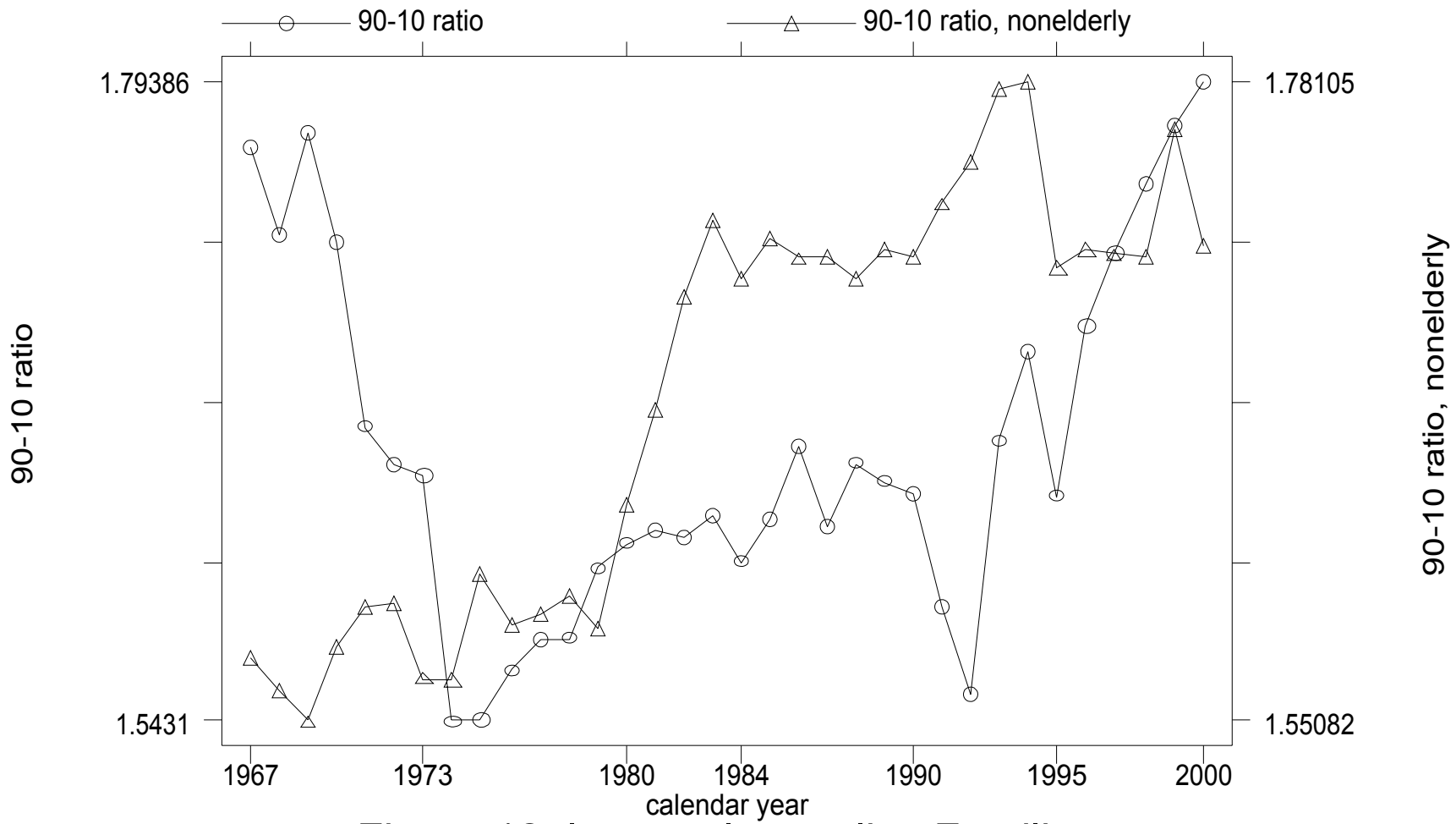

Figure 12: Income Inequality, Families

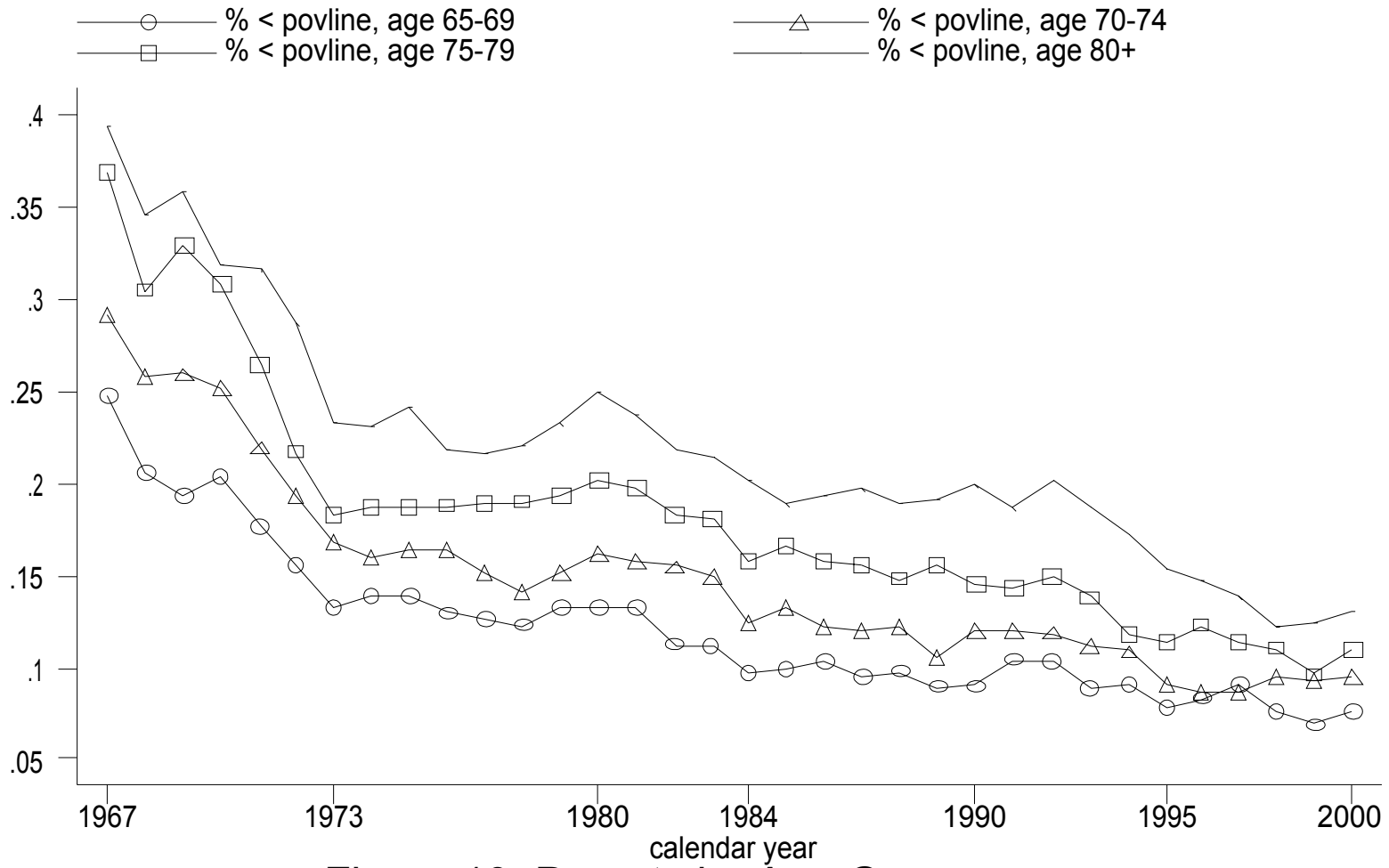

Figure 13: Poverty by Age Group

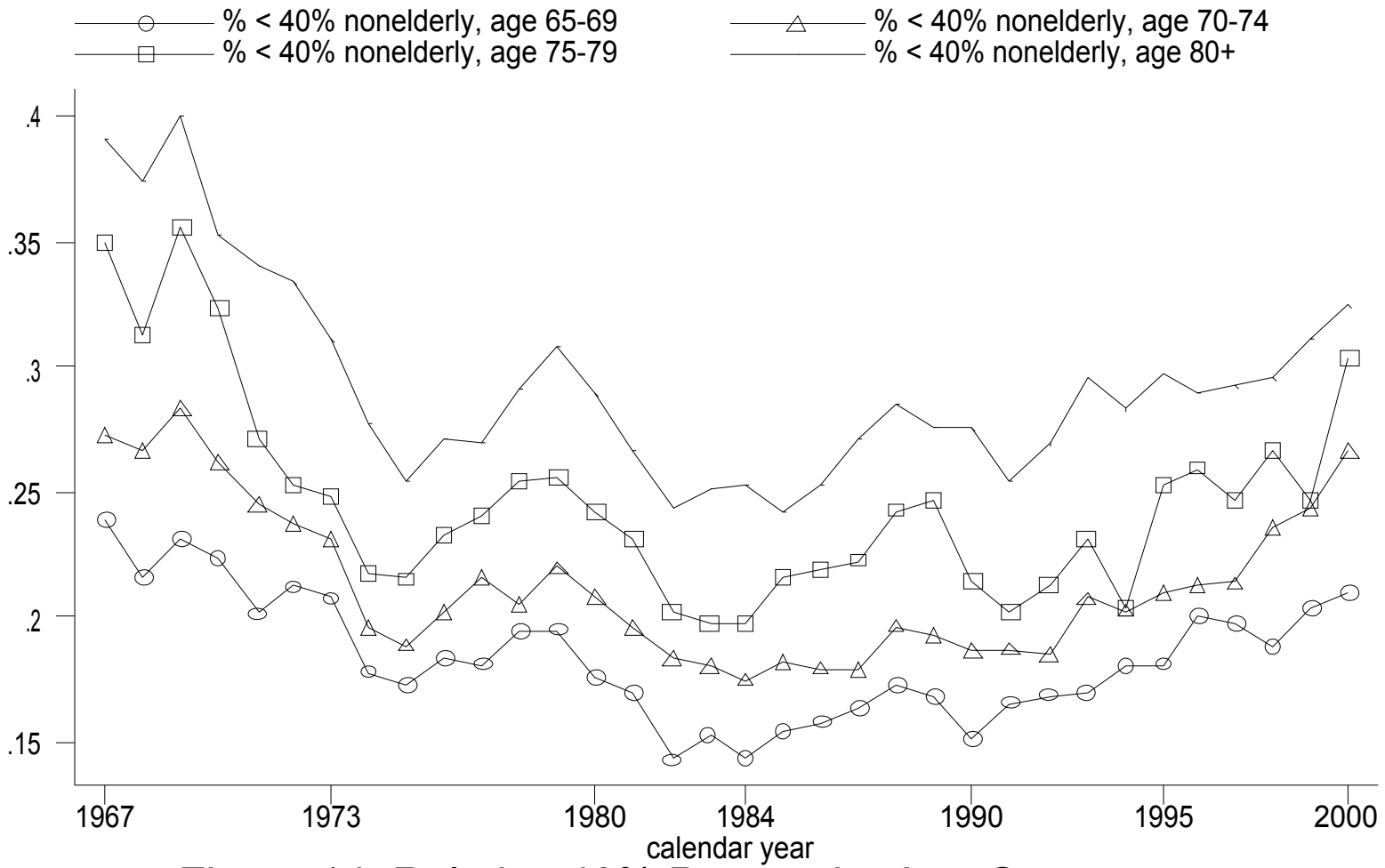

Figure 14: Relative 40% Poverty by Age Group

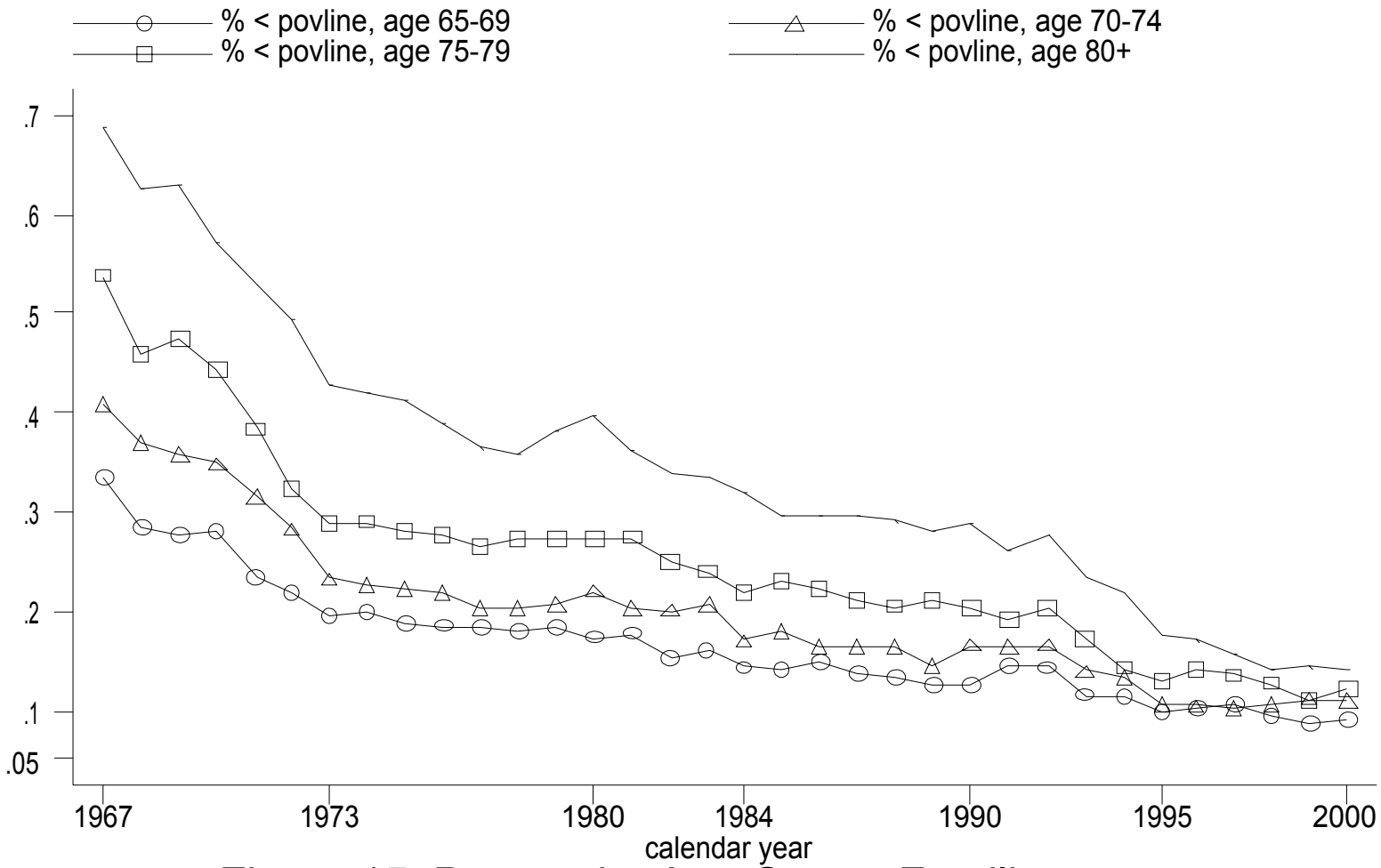

Figure 15: Poverty by Age Group, Families

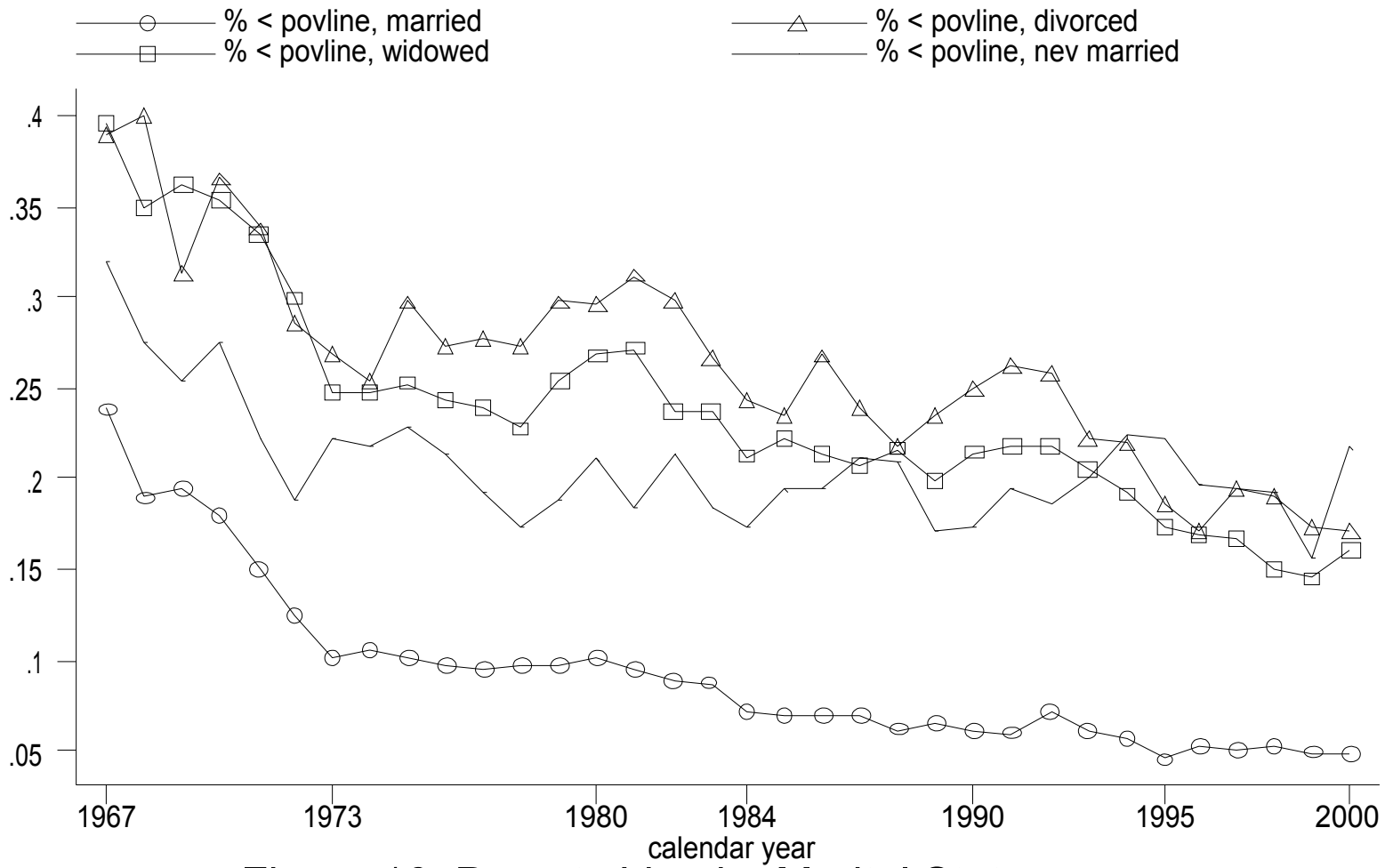

Figure 16: Poverty Line by Marital Status

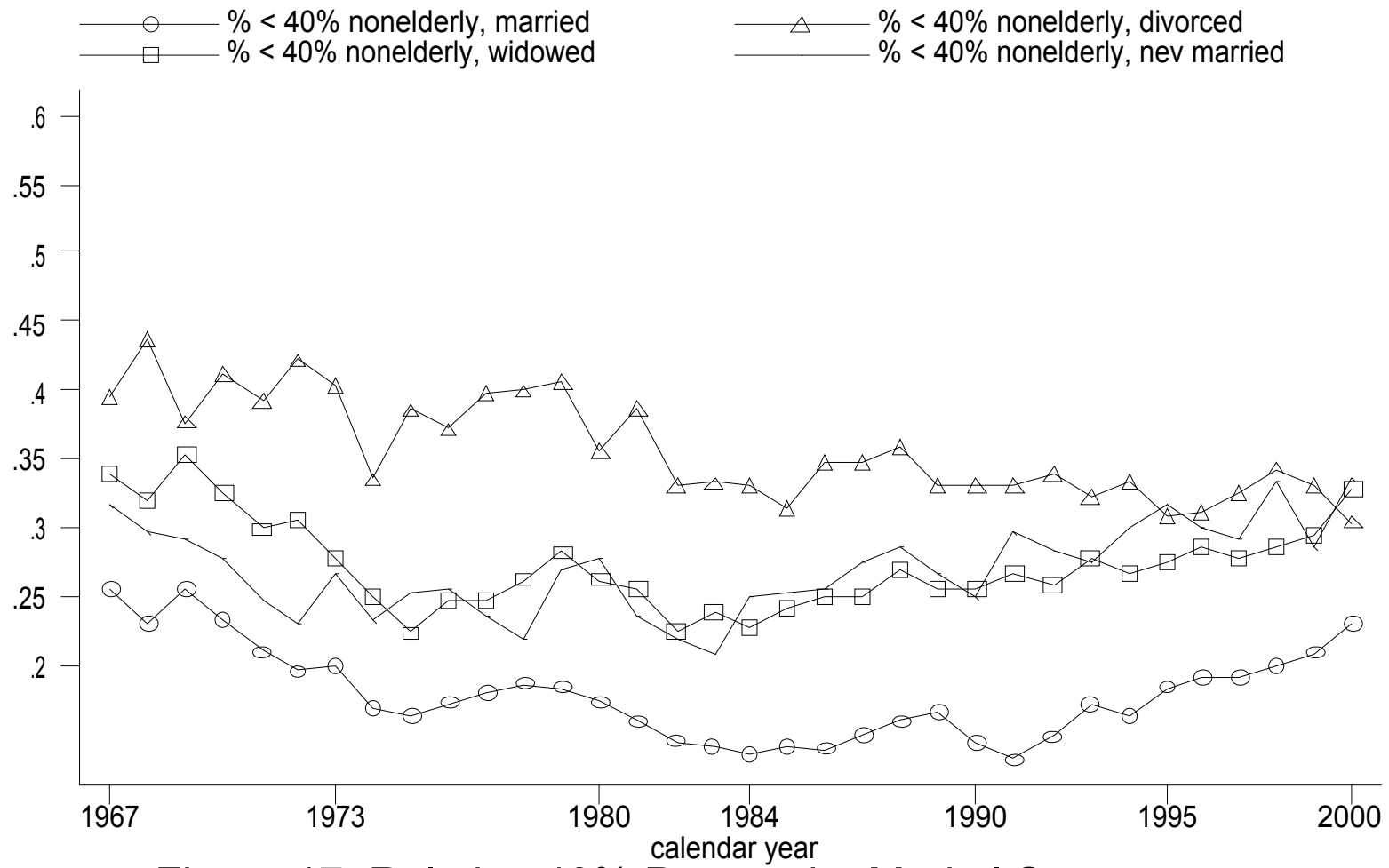

Figure 17: Relative 40% Poverty by Marital Status

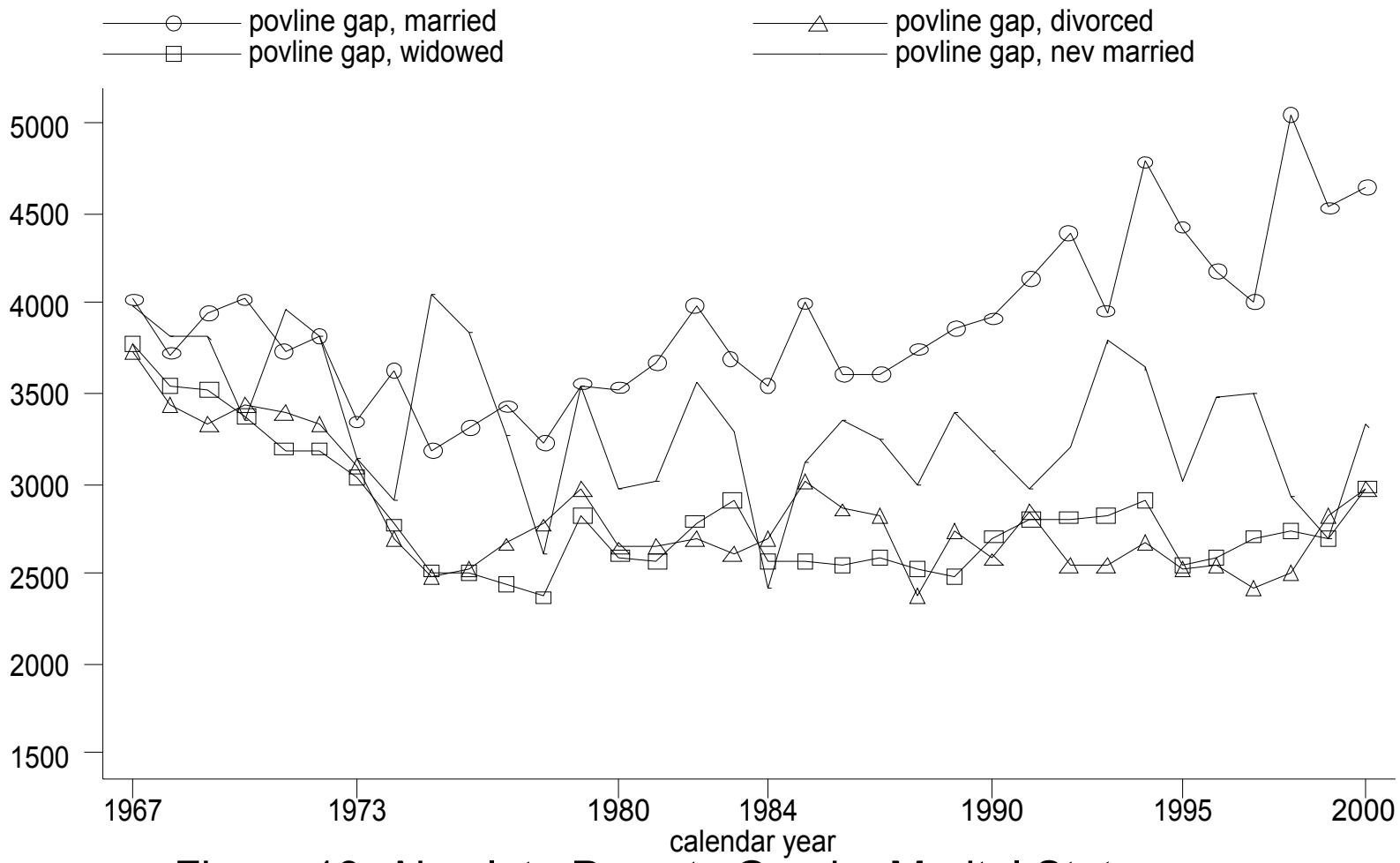

Figure 18: Absolute Poverty Gap by Marital Status

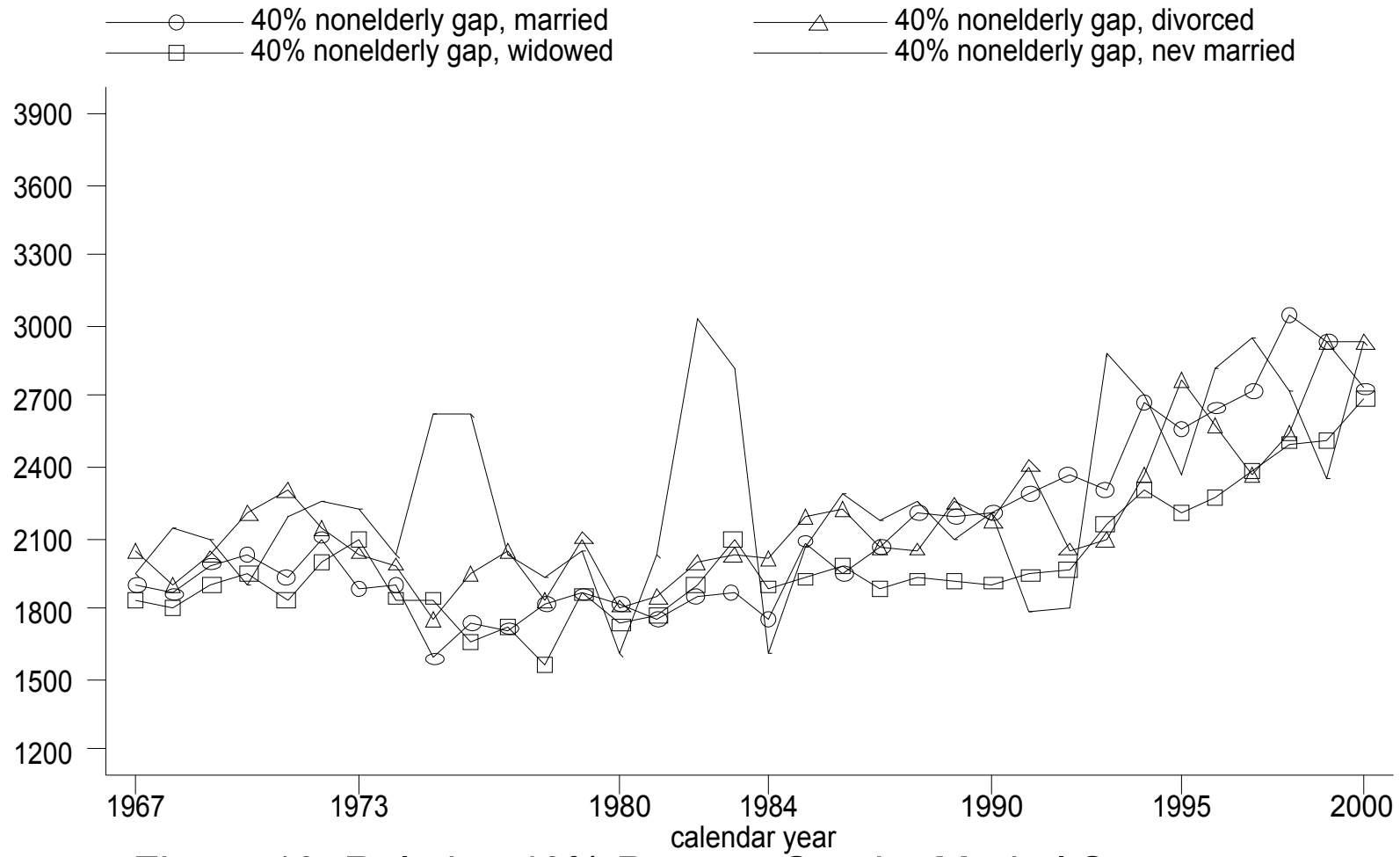

Figure 19: Relative 40% Poverty Gap by Marital Status

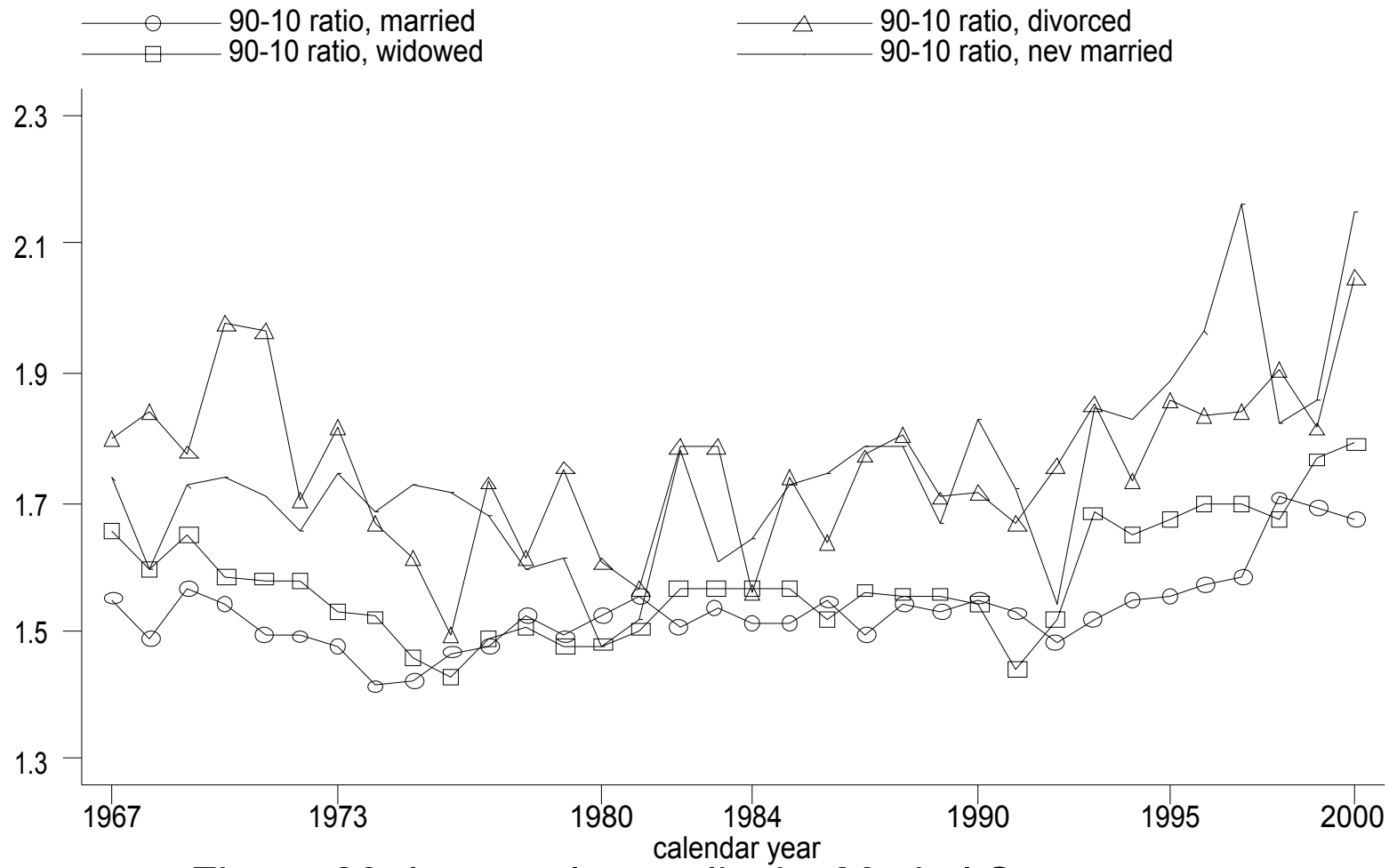

Figure 20: Income Inequality by Marital Status

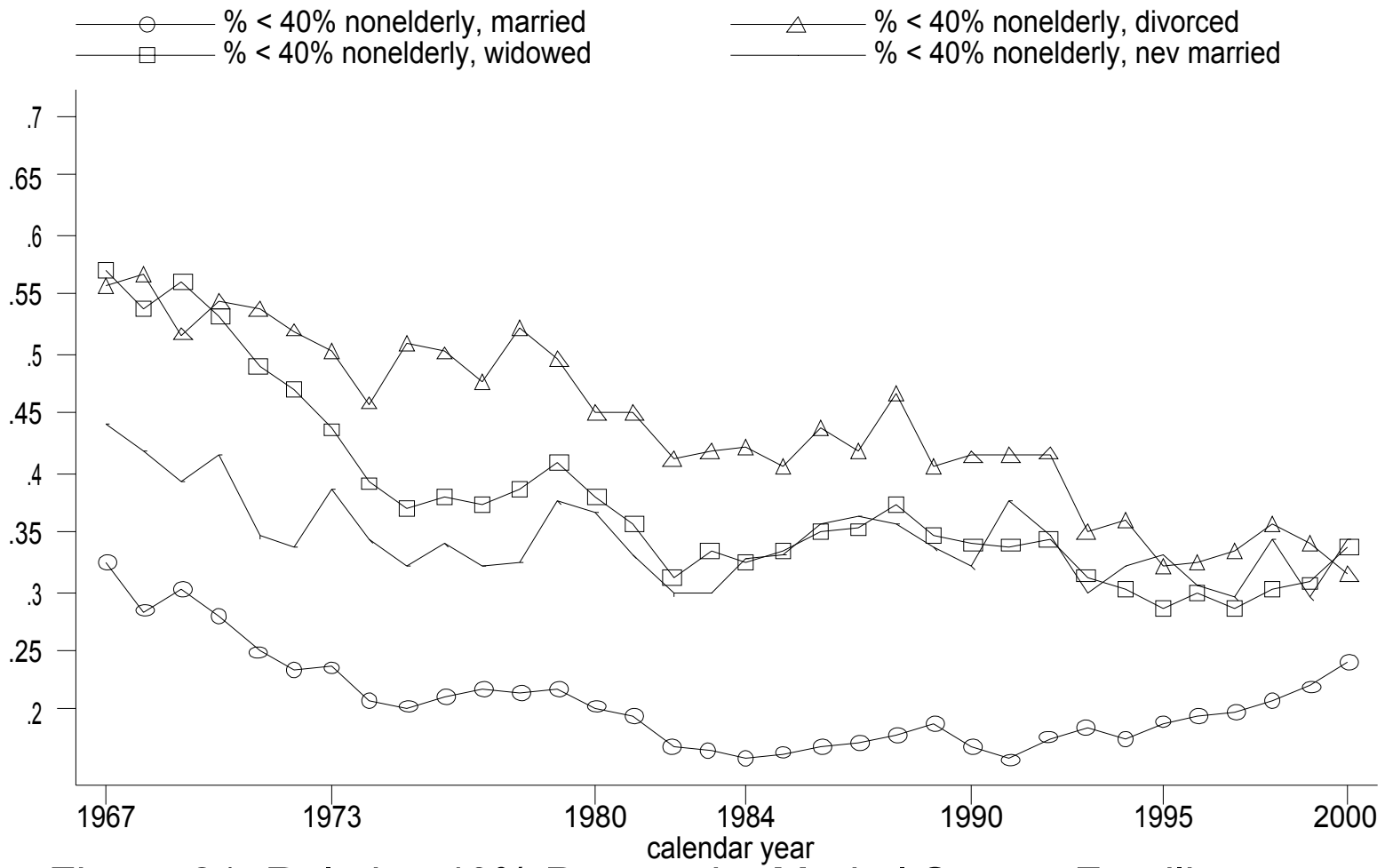

Figure 21: Relative 40% Poverty by Marital Status, Families

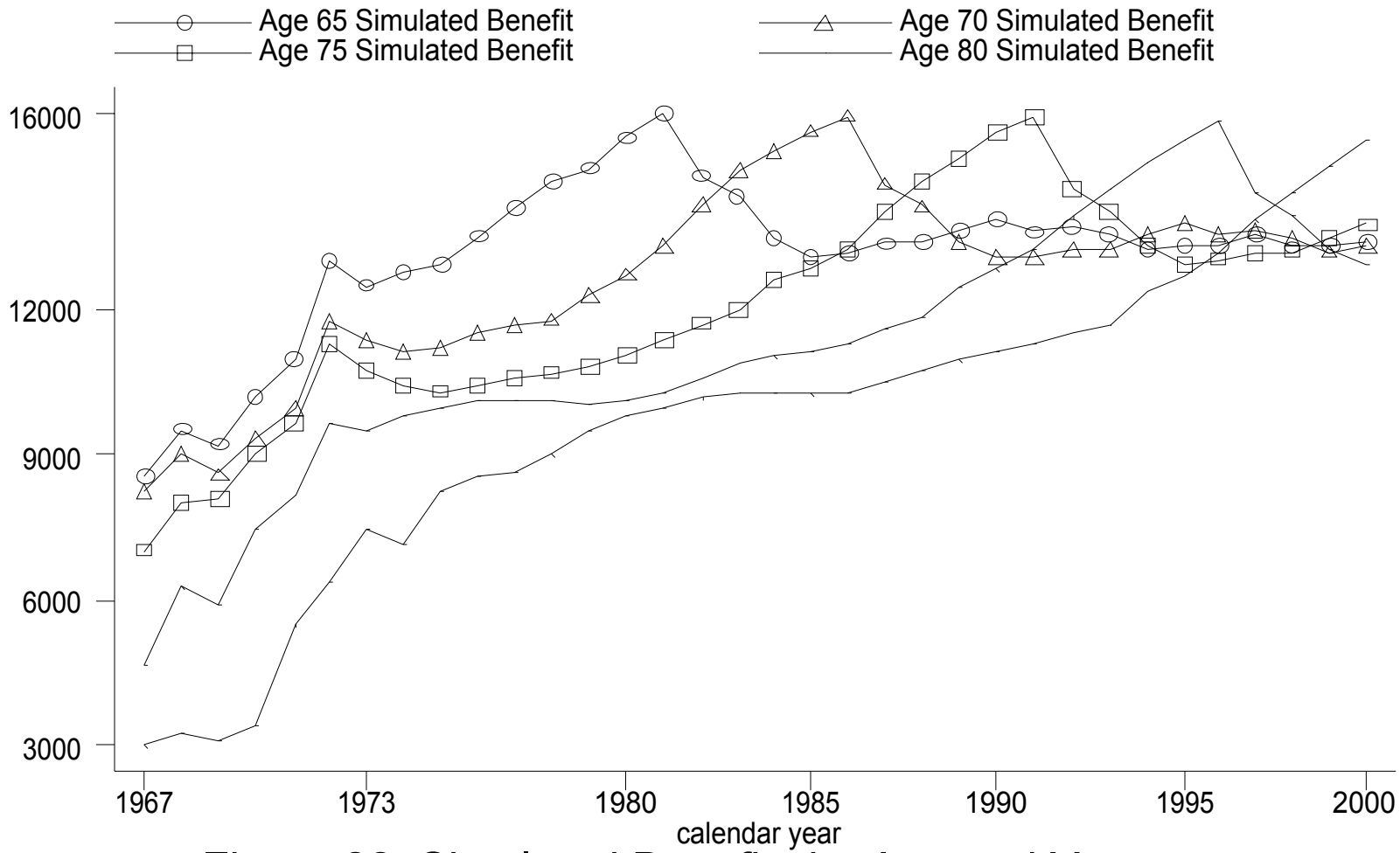

Figure 22: Simulated Benefits by Age and Year