Earnings Responses to Increases in Payroll Taxes

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Abstract

This paper uses SIPP data matched to longitudinal uncapped earnings records from the Social Security Administration for 1981 to 1999 in order to analyze the earnings responses to increases in tax rates and inform discussions about the likely effects of raising the Social Security taxable maximum. The earnings distribution of workers around the current taxable maximum is inconsistent with an annual model in which people are highly responsive to the payroll tax rate, even in the subset of self-employed individuals. Panel data on high-earnings married men display a tremendous increase in earnings over the 1980s and 1990s relative to other groups with no clear breaks around the key tax reforms. This suggests that other income groups cannot serve as a control group for the high earners. Our analysis does not support the finding of a large behavioral response to taxation by wives of high earners. We actually find a decrease in the labor supply of wives of high earners around both the 1986 and the 1993 tax reforms, which we attribute to an income effect due to the surge in primary earnings at the top. Policy simulations suggest that with an earnings elasticity of 0.5, lost income tax revenue and increased deadweight loss would swamp any benefits from the increase in payroll tax revenue. In contrast, with an elasticity of 0.2, the ratio of the gain in OASDI revenue to lost income tax revenue and deadweight loss would be much greater.

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1. Introduction

A 12.4 percent Old Age Survivors and Disability Insurance (OASDI) payroll tax is assessed on the first $94,200 of a U.S. worker's earnings.[1] Earnings above $94,200 are exempt from this tax. This exemption means that only 86 percent of earnings by workers who are covered by Social Security are currently subject to OASDI payroll taxes, and this fraction is expected to fall to under 85 percent by the end of the decade.[2] When the Social Security payroll tax was first introduced in 1937, ninety-two percent of covered earnings were taxable. This level has fluctuated over time, reaching a low of 71 percent in 1965. The 1977 amendments to the Social Security Act restored the level to 90 percent, but the level has eroded over the past 25 years as earnings growth among high earners has exceeded that of other workers. Moreover, although wages as a percentage of total compensation have remained fairly steady in recent years at around 90 percent, there is concern that if health cost growth continues to exceed GDP growth, the share of non-wage compensation will rise, reducing the Social Security wage base relative to total compensation.

Among the policy options for closing the long-run gap between Social Security expenditures and revenues is to increase the share of covered earnings that is subject to the OASDI payroll tax. For example, legislation introduced several years ago by Senators Moynihan and Kerrey would have increased the maximum level of earnings subject to taxation so that 87 percent of earnings would be covered by Social Security. Later, legislation introduced by Senator Moynihan alone would have raised the limit to 90 percent of earnings. Former President Clinton carefully ruled out raising the payroll tax rate but not the tax base. Plan 3 of President Bush's Commission to Strengthen Social Security originally envisioned raising the maximum taxable earnings level to cover 90 percent of earnings, though in the final report this provision was replaced by a general revenue transfer from an unspecified source that was described in a footnote as equaling the amount of revenue that would be gained from increasing the maximum

[1] This is the 2006 maximum. The amount is adjusted annually based on the growth rate of average wages.
[2] Only 5.5 percent of covered workers have earnings above the maximum taxable level. These numbers are preliminary data for 2003 from the *2005 Annual Statistical Supplement to the Social Security Bulletin*.

taxable earnings level. Still other experts have suggested that the cap on taxable earnings be removed altogether as was done for the Medicare payroll tax in 1993.[3]

Although public finance economists generally prefer base-broadening to tax-rate increases as a way to increase revenue (since deadweight loss rises in proportion to the square of the tax rate but only linearly with the tax base), some have argued that raising the payroll tax base would be a particularly inefficient way to raise additional revenue for Social Security (Feldstein, 2004). This argument relies on recent research by Feldstein (1995), Eissa (1995), Auten and Carroll (1999), and Gruber and Saez (2002) that has shown that high-income taxpayers are more sensitive to taxation than lower income taxpayers. Those opposing an increase in the taxable maximum have argued that the high elasticities estimated in these papers imply that focusing a 12.4 percentage point tax increase only on high earners (with high pre-existing tax rates) would produce mostly deadweight loss and raise relatively little revenue. Moreover, they argue that for the government as a whole, some or all of the increased OASDI revenue would be offset by a decline in Medicare and income tax revenue.

There are, however, several reasons why this result is far from certain. First, for increases in the maximum taxable earnings level that do not eliminate the cap altogether, there may still be a substantial number of taxpayers – those with earnings above the new limit – for whom the tax increase will be inframarginal. In other words their marginal tax rate will not change, and there will be no efficiency effects on those taxpayers (indeed, we might observe an increase in their earnings due to the income effect). Thus, determining the impact of a particular policy requires careful simulation of the responses of both taxpayers between the old and new tax thresholds and those above the new tax threshold. Second, most of the evidence suggesting large elasticities for high-income taxpayers has used tax return data and focused on broad income measures such as adjusted gross income (AGI) or taxable income. Because there are more opportunities to manipulate AGI or taxable income through asset transactions, taking deductions, and noncompliance than there are for earnings (and because even the standard and itemized deductions mechanically exclude some earnings from income taxation), the elasticity estimates for high earners for these broader measures of income are not directly relevant

[3] See Diamond and Orszag (2005) for discussion of some such options.

for studying the response of the wage base to changes in the Social Security tax base. Indeed, Gruber and Saez find that even when shifting from taxable income to AGI as an income measure average elasticities fall from 0.45 to around 0.15. One would expect average earnings elasticities to be even lower. Third, tax-return based studies are forced to aggregate the earnings of husbands and wives since these are reported together on the income tax return. However, there is good evidence that labor supply elasticities differ for men and women (Mroz 1987, Eissa 1995), and a careful analysis of responses to changes in the Social Security tax base would need to take these differences into account; in particular married women make up a relatively small fraction of workers with earnings levels above the current taxable maximum.

In this paper, we provide new evidence on the earnings response to taxes using a special version of the Survey of Income and Program Participation (SIPP) that has been matched to administrative earnings records from the Social Security Administration. We show that the distribution of taxpayers around the taxable maximum is quite smooth – and is therefore inconsistent with a high degree of earnings responsiveness to taxes under the standard one-period labor supply model with fully-informed individuals and no uncertainty. This is true for the entire population as well as for the self-employed – a group that presumably has a higher-than-average amount of control over their earnings levels. We also examine the earnings behavior of taxpayers at different points in the income distribution around the time of the 1986 tax reform (which reduced marginal tax rates for high earners) and the 1993 tax reform (which increased marginal tax rates for high earners). For men we find that the pre-existing trends for very high earners were quite different than those for even slightly-lower earners and that there is no evidence of a break in these trends around the tax reforms. We also revisit the famous, but never-published, findings of Eissa (1995) regarding women married to high earners. Our results suggest that there is little empirical support for the proposition that women married to high earners altered their labor supply behavior in response to the major tax changes in recent decades.

2. Background

Until about 15 years ago, the conventional wisdom was that people's incomes were largely unresponsive to taxation. Empirical studies of the responsiveness of hours worked to marginal tax rates found elasticities very close to zero, particularly for prime-age males. While there was greater uncertainly about estimates for females – with some evidence of an extensive-margin response (Mroz 1987, Hausman 1981) --, and there were some structural models such as those by Hausman (1981) that suggested large compensated elasticities, the bulk of the evidence suggested small amounts of deadweight loss from taxation.

In recent years, a new view has emerged. This new view is based on the insight that workers can respond to taxes by changing their behavior in many ways –not simply by varying their hours worked. For example, workers can alter the intensity of their work effort per hour, their risk taking, their compliance behavior, the composition of their compensation between untaxed fringe benefits and taxable monetary pay, the split between compensation that is taxed as labor income and compensation taxed as capital income, and their itemized deductions. All of these behavioral responses contribute to the distortionary effects of taxation and can be analyzed by studying how taxable income responds to tax rates (Feldstein, 1999).[5]

This theoretical insight coincided with the emergence of a new empirical approach to measuring behavioral responsiveness to taxation – using tax reforms as natural experiments. If taxpayers understand how their budget constraints are changing and can alter their behavior within a few years of a change in tax laws, then it is possible to measure the behavioral response to taxation by comparing outcomes before and after the change in tax laws. Since other features of the economy are always changing, this methodology, applied first in Lindsey (1987), generally requires a control group – a set of taxpayers who are similar to the ones affected by the tax change but who were not affected by it. There are four key empirical studies upon which the new view is built. Feldstein (1995) analyzed panel tax return data and showed that the reported incomes of the 57 very-high-income married couples in his data set increased much faster than the

[5] Slemrod (1995) raises an important issue which we ignore in our analysis – that behavioral responsiveness on one margin will likely depend on what other margins are available to respond along.

reported incomes of lower-income taxpayers from 1985 to 1988. He attributed this differential increase to the Tax Reform Act of 1986 which lowered marginal tax rates much more at the very top than at other points in the income distributution and estimated very large elasticities of reported incomes with respect of the net-of-tax rate (between 1 and 3). Auten and Carroll (1999) replicated the Feldstein study using a much larger panel of tax returns available at the U.S. Treasury and estimated taxable income elasticities around 0.6. Eissa (1995) showed, using CPS repeated cross-section data, that women married to very high income husbands increased their labor supply along both the extensive and intensive margins, relative to women married to middle-high income husbands between 1983-1985 and 1989-1991. She also attributes those patterns to the Tax Reform Act of 1986 where women married to very high income husbands experienced large marginal tax rate reductions relative to other married women. She finds labor supply elasticities for married women around one. Gruber and Saez (2002) use panel tax return data from 1979 to 1990 and study the behavioral response to the entire set of tax changes that occurred in the 1980s . They find that elasticities for high-income taxpayers are higher than those for lower income taxpayers and that the elasticity of taxable income is larger than the elasticity of income before deductions.

These findings have been challenged on several grounds. First, the samples of very high income taxpayers used in several of these papers were quite small. Feldstien (1995) does not present any standard errors for his estimates and the 95 percent confidential intervals for Eissa's (1995) elasticity estimates include zero. Second, some have questioned whether samples of lower-income taxpayers can serve as adequate control groups for higher income taxpayers (Goolsbee, 2002). Very high income taxpayers have different income sources that respond differently to economic conditions. Rising income inequality has meant that the incomes of very high income taxpayers have been rising much more rapidly than the incomes of those who are even slightly lower in the income distribution, and these trends are not adequately controlled for in most of the natural experiment studies. And very high income taxpayers are more likely to shift income across years in response to tax reforms in ways that can lead natural experiment studies to confuse short-term timing shifts with permanent responses. Tax reforms may also prompt behavioral changes that shift income between the corporate income tax and the personal income tax. Studies that look only at the personal income tax system can confuse this shift with a permanent change in revenue levels (Slemrod, 1995). Slemrod (1998) and Saez (2004) provide summaries of this literature and of these identification issues.

Moreover, for the question at hand, most of these results, even if internally valid, are not directly applicable. Three of the four studies described above focus primarily on taxable income. As was mentioned before, taxable income responses are likely to be larger because there are more margins that can be adjusted than is possible with earnings. The only one of these studies that focuses on earnings focuses on married women, a group that we will see shortly makes up a very small fraction of the high earners who would experience increases in marginal tax rates if the social security maximum taxable earnings level were raised. Thus there is need for direct empirical evidence on earnings.[7]

3. Data

To study the earnings behavior of taxpayers at and above the current Social Security taxable maximum, one needs uncapped earnings data from a large sample of the population. Standard survey data sets such as the CPS are not ideal for this purpose because they top code data on high earners and contain measurement error. Standard tax-return based samples are also of limited use for this kind of study because the earnings of both spouses in married couples are usually aggregated together on the wage and salary line of the tax form, whereas the OASDI payroll tax applies to each spouse individually. Finally, a panel data set is strongly preferred for studying behavioral responses to tax reforms because in repeated cross-section analyses the composition of taxpayers in the different income groups can change over time in ways that may bias estimates.

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[7] Other studies (Gentry and Hubbard 2004, Goolsbee 2006) have specifically analyzed the effects of taxes on entrepreneurship, which in some cases can correspond with the self-employment component of OASDI earnings.

For this study we make use of a special data set that has been created via cooperation between the Census Bureau, the Social Security Administration, and the Internal Revenue Service. The data set matches many of the panels from the Survey of Income and Program Participation to administrative earnings records. Originally, the SIPP was matched to the Social Security Administration's summary earnings file which contains only earnings up to the taxable maximum in each year. However, in the past few years it has been possible for researchers who are special sworn Census Bureau employees to work with the SIPP matched to the raw uncapped wage and salary information from a worker's W2 along with measures of self-employment earnings originating from the worker's tax return.

The data we use consist of the 1984, 1990, 1991, 1992, 1993, and 1996 SIPPs which have been matched to uncapped earnings data that extend from 1981 to 1999. Roughly 86 percent of SIPP sample members can be successfully matched to earnings records. We reweight the successfully-matched portion of the SIPP samples to represent the full sample – by adding a component to the standard SIPP weights that comes from regressing the probability of being a successful match conditional on SIPP observables. Further details on the match procedure are in an appendix that is available from the authors.

We can explore whether the SIPP-matched sample is representative of the overall population of administrative earnings records by comparing the administrative earnings distribution in our sample to published distributions from the Social Security administration. Appendix Figure 1 shows that there are more individuals with earnings below $20,000 in the published SSA tables than in our data set. We do not have a good explanation for why the SIPP-SSA match has too few low earners, though one of us found a similar pattern in matching the CPS to tax return data (Liebman, 1996). Further analysis (not shown) reveals that we match the published distribution much more closely at the higher earnings levels that are the focus of this study.

Table 1 shows some simple descriptive statistics for workers at different points in the earnings distribution using the 1996 SIPP panel and the 1996 administrative earnings data (this is an appealing subset of the data to use since it is the latest year for which the survey date and the date of the administrative data correspond). The top row of the table shows that average earnings in the administrative records for workers with earnings below the 1996 taxable maximum of $62,700 were $16,051. Average earnings for those between the taxable maximum and the level that would result in 90% of covered earnings being taxed was $71,869. Finally the average earnings of those above the 90% of covered earnings level was $172,239. The next two rows of the table decompose these earnings into wage and self-employment earnings. For those below the taxable maximum, self-employment earnings made up 4.2 percent of total earnings; for those in the middle group, self-employment earnings were 6.4 percent of earnings, and for those in the top group they were 14.9 percent of earnings. The share of workers with any self-employed earnings shows a similar pattern. 7.4 percent of the lowest group, 13 percent of the middle group, and 23.8 of workers in the top group had self-employment earnings (often in conjunction with wage earnings). The mean age was a bit higher in the higher earnings groups than in the lower-earnings group. But the share of earners who were over 54 – an age group whose retirement decisions could be affected by tax rates -- was lower in the two high-earnings groups than in the lower-earning group

The gender and marital status patterns vary considerably across groups. Only 31.3 percent of workers in the low-earning group were married males, compared with 68 percent of the group between the taxable maximum and 90 percent of covered earnings and 79 percent of those in the top group. In contrast, the share of married females and of unmarried males and females is much lower in the groups that would be directly affected by an increase in the taxable maximum. Taken as a whole, these descriptive statistics suggest that the bulk (almost 70 percent) of those who would see their marginal tax rate increase if the taxable maximum were raised are prime-age married – a group that is generally thought to have low earnings responsiveness to taxation. However, the large number of self-employed workers and the non-trivial fraction of married females might be expected to have greater responsiveness.

4. The Distribution of Earnings around the Current Taxable Maximum

Standard economic theory makes strong predictions about the location of workers in relationship to kinks in the tax schedule. At a kink point where marginal tax rates increase with earnings levels, we should observe a bunching of earnings just at or below the kink.[8] For a kink, like that produced by the social security taxable maximum, where marginal tax rates fall, there should be a gap in the earnings distribution. This gap should be visible even with relatively low responsiveness to taxation. The top panel of figure 1 shows the gap that would occur under the standard model if the earnings elasticity were 0.20.[9] The bottom panel of figure 1 shows the actual distribution of earnings around the taxable maximum. There is no gap whatsoever. Figure 2 takes our full data set of earnings from 1991-1998 and plots earnings relative to each year all combined on a single figure so as to smooth out the noise that was present in the 1996 figure because of the moderate sample size.[10] The distribution is completely smooth around the kink point. Indeed, for this graph to arise under the standard model, the implied distribution of earnings without the tax variation would require a big hump in earnings around the taxable maximum, something that is clearly implausible. Figure 3 shows that even among the self-employed – who are generally though to have substantial control over their earnings -- there is no gap in the earnings distribution at the taxable maximum.

These pictures are very difficult to reconcile with the model underlying the natural experiment evidence suggesting high elasticities – that people are aware of marginal tax rates and are able to respond relatively quickly to them. Instead, they suggest that people are unresponsive to the marginal tax rates implicit in the payroll tax – and certainly unresponsive to the exact location of the taxable maximum (which of course would be the key question if the threshold were raised to say 90 percent of

[8] Liebman (1998) studies bunching around the kinks generated by the EITC and finds no evidence of bunching. Saez (2002) studies bunching around kink points of the federal tax schedule. He does not find evidence of bunching except for the self-employed around the first kink point of the EITC. The one place where there is a clear evidence of bunching for wage earners is around the kink created by the Social Security retirement earnings test (see Friedberg, 2000 and Burtless and Moffitt, 1984).

[9] This figure is created by assuming that preferences are quasilinear with U=WL(1-t)-[L^(1+k)]/(1+k) and a constant tax rate and then inverting the first order condition to uncover the (smooth) wage distribution. Then with the smooth wage distribution we simulate behavior under the actual nonlinear tax schedule.

[10] We restrict the figure to 1991-1998 because our self-employment data are the amounts subject to the Social Security and Medicare tax and are therefore available above the taxable maximum only after the Medicare cap was raised in 1991 to $125,000 (it was completely eliminated in 1994).

earnings). If this is true, the deadweight loss associated with an increase in the taxable maximum could be negligible.

It is possible to come up with models in which people's behavior is distorted by the taxable maximum, yet they do not avoid earnings levels around the kink point. One possibility is that a portion of earnings are random so that people cannot optimize perfectly. The potential importance of this explanation depends on the share of the year-to-year variation in earnings that is unpredictable. Another possibility is that people have little short-term (say under 10 years) control over their earnings levels. However, this assumption would undermine the natural experiment studies of tax reforms (as would the assumption that people are solving a complicated lifetime dynamic problem when making their labor supply decisions – and stopping at a point that is suboptimal in a static model on the way to some other location). Liebman and Zeckhauser (2005) propose an alternative explanation – that some people misperceive tax schedules in systematic ways while other people are rational but have considerable uncertainty about the location of kink points in the tax schedule. These sorts of models can explain the lack of the gap in this model but tend in the direction of people responding to average tax rates rather than marginal tax rates – which Liebman and Zeckhauser show implies that optimal tax rates on high earners should be much higher than under the standard assumption that people respond to marginal tax rates.

5. Earnings Responses to Tax Reforms

A second methodology for examining the sensitivity of earnings to marginal tax rates is to compare earnings levels before and after a change in marginal tax rates. The ideal change to study would be a change in OASDI payroll tax rates. Unfortunately, annual changes in the OASDI contribution rates and in the maximum taxable earnings levels have been too small and gradual to allow such an investigation. Instead, we study the earnings response to two broader tax reforms: the Tax Reform Act of 1986 (TRA86) and the Omnibus Budget Reconciliation Act of 1993 (OBRA 1993). TRA86 cut marginal federal income tax rates for very high earners from 50 percent to 28 percent. OBRA93 raised marginal tax rates for high earners by 10.9 percentage points (the top income tax rate was increased from 31 to 39.6 percent and the cap on HI taxes was removed, making the top rate effectively 41.9 percent).[11] While there have been numerous studies that have studied the response of broader income categories such as AGI and taxable income to these tax reforms, there is little work that has focused on the earnings response, other than Eissa's work on the wives of high earners.

For each tax reform, we pool all of the six SIPP panels that we have access to and construct a panel data set of married couples. Our intention is to analyze a sample of married couples who were continuously married during our analysis period.[12] For our TRA86 analysis, we use the SIPP retrospective marital status history topical modules to determine whether people in the 1990, 1991, 1992, 1993, and 1996 SIPP panels were continuously married back to the beginning of our analysis period (1981). For our OBRA93 analysis we include people who were continuously married back to 1988. In both analyses, we include all married couples from the 1984 SIPP panel since we cannot observe martial status beyond the end of the SIPP survey period.[13] We further restrict the sample to those between the ages of 21 and 56 in the year of the tax reform (1986 or 1993) so that retirement choices do not dominate the analysis.

Table 2 shows some descriptive statistics for the 1986 tax reform sample (similar statistics for the 1993 sample are in table 5). To study the behavior of the very high income groups who were affected by the tax changes, we divide the sample into six income groups following Eissa (1995), and use various of the lower-income groups as control groups in studying the behavior of the highest income group. Our groups are formed by ranking households based on husband's average earnings between 1983 and 1989.[14] We average over both the pre-reform and post-reform period to minimize the mean-reversion bias that would occur if one ranked households only on pre-reform earnings. The three groups shown in table 2 are the three that were studied by Eissa (1995). The 75th percentile group consist of those with average husband's earnings

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[11] The effective rate is (0.396+0.029)/(1+0.0145)=41.9% as the federal income tax rate does not apply to employer HI payroll contributions.

[12] Feldstein (1995) and Gruber and Saez (2002) similarly focus on taxpayers with no marital status changes.

[13] Our results are insensitive to dropping the 1984 panel.

[14] Note that unlike Eissa (1995) we rank only on husband's earnings, not on husband's earnings plus the limited components of asset income measured by the CPS. Relative to Eissa, our approach has the advantage that it is based on administratively measured data that is not top coded and on panel data rather than repeated cross sections, but it has the disadvantage that it does not include any asset income.

between the 75th and 80th h percentile. The 90th percentile consists of those between the 90th and 95th percentile, and the 99th consists of those above the 99th percentile.

Notice that the 99th percentile sample size is only 250 (and is about one-fifth as large as the other two groups). Thus, even when pooling the 209,000 individuals in the six SIPP panels, the restriction to continuously married couples and very high earners produces a fairly small sample. Notice also the four rows at the bottom of the table which show the average earnings of husbands in different groupings of pre-reform and post-reform years. In the 75th percentile sample, average earnings rose by about 10 percent from the pre-TRA86 period to the post-TRA86 period. In the 90th percentile sample, earnings rose by 15 to 20 percent. In the 99th percentile sample, earnings almost doubled. So either tax policy had an extraordinary effect on the high earners or the other things going on in the economy (including possibly different age-earnings profiles for very high earners) made the experience of the high-earnings group very different than that of the other groups.[15]

Figure 4 shows that the latter is almost certainly the case. This figure shows the change in the mean earnings of married men relative to 1981 for our six earnings groups. The top panel shows the increase in dollars. Because the large increase in the top group makes it hard to see the changes for the lower-income groups, the bottom panel shows the increase for each group relative to that group's 1981 earnings level using a logarithmic scale. From the figure we can see that over the 1981-1991 period, average earnings of the married men in the highest earnings group grew by $200,000. Average earnings for this group was about $100,000 at the beginning of this period, so the gain was a 200% increase. In contrast the 90th percentile group experienced only at 50 percent increase over this period and earnings for the bottom 80 percent hardly increased at all. The increase over this period for the highest earnings group was steady and shows no break in the trend around the time of TRA86. We draw several conclusions from these data. First, there is nothing in these data that would lead one to believe that taxes were a major part of the story for the increase in earnings among high earners. Second, since the underlying trend is so large and varies so dramatically across the income groups, it is

[15] Saez (2004) points out that it is difficult to attribute the full increase of top incomes since the 1980s to tax changes only.

impossible to know what the counterfactual trend would have been in the absence of TRA86 – and to rule in or out a tax effect. Third, it seems almost ludicrous to imagine that taxpayers in the 75th percentile group of even 90th percentile group could be an adequate control group for the 99th percentile high-earner group.[16]

Figures 5 and 6 show the corresponding trends for the wives of the husbands we observed in Figure 4. Figure 5 shows the change relative to 1981 in the fraction of wives with positive annual earnings. Figure 6 shows the average earnings (including zeros) of the wives. In the first of these figures we see that there was a large *drop* in the annual labor force participation of 99th percentile wives starting in 1987 – just after TRA86. This is the opposite of the Eissa (1995) finding.[17] Notice that annual labor force participation rates are flat for the 90th and 95th percentile groups and rising for the three other groups. Thus, this behavior of the very high income wives seems to be fundamentally different than that of the other groups. We think the most likely story is an income effect. Given that their husband's earnings are tripling over this period it is not surprising that some of the 99th percentile wives left the labor force. In figure 6 we see that the pattern of earnings for wives married to high earners is also quite different from that of the other groups, both in its underlying trend and in the change before and after 1986. For the 99th percentile wives, earnings are flat. For the other five groups they are rising steadily.

Tables 3 and 4 show when performing Eissa-style difference-in-differences regressions, the differences between the 99th percentile and the other groups in their before and after TRA86 outcomes are statistically significant. For each table we present

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[16] Note that Eissa was probably unaware of the extent to which the high-earner husbands differed in their income growth from the other groups because the CPS is top-coded -- so the growth in earnings was not observable in her data set. Appendix Table IV shows that almost two-thirds of the households in Eissa's 99th percentile sample were affected by top coding. Appendix Figure 4 shows that because of this top coding Eissa's income family income measure was constant in real dollars over this time period for the high income groups.

[17] A significant fraction of the wives leaving the labor force were earning less than $2500 in the pre-TRA86 period. When people with less than $2500 of earnings are dropped from the analysis there is still a drop in earnings but the figure appears smooth and continuous.

this result in 16 different ways to show whether or not the results are sensitive to alternative specifications. We present results relative to the two control groups (90th percentile and 75th percentile) used by Eissa. We present results with and without age covariates. Finally we show results for two different definitions of the pre-TRA period and two different definitions of the post-TRA period. We draw three conclusions from our analysis of the data on wives. First, the underlying trends before TRA86 for the different income groups are so different that it seems unlikely that any lower income group could serve as an adequate control group for the 99th percentile group. Second, because the husband's earnings were changing so dramatically for the 99th income group, other groups would not be adequate control groups even if the pre-TRA86 trends in female labor force behavior had been similar. Third, when one uses a panel data set with high quality administrative earnings records one finds statistically significant negative "effects" of TRA86 – the opposite of the (not statistically significant) Eissa finding.

Figures 7, 8, and 9 repeat this analysis for the OBRA 1993 sample. This sample differs from the TRA86 sample in that the income groups are formed based on average 1990 to 1998 earnings rather than 1983 to 1989 earnings. In addition, consecutive years of marriage are required only back to 1988, not back to 1981. The basic trends are similar to those in the earlier sample. First, the earnings of the 99th percentile husbands are increasing much more rapidly than those in the other groups. Second, relative to the other groups, over the entire sample period the annual labor force participation of the wives of the very high-earners is falling. However, this flattens out in the aftermath of the increase in marginal tax rates imposed in OBRA93, resulting in estimates that are very near zero for the difference-in-difference regressions in Table 6. Again, this is counter to what would be expected from the change in marginal tax rates. The trend decline in labor force participation among wives of high earners should accelerate in response to the increase in marginal tax rates, not disappear. Third, average earnings pick up after OBRA93 for the wives of high earners -- again this result, though statistically insignificant, is the opposite of what would be predicted if the tax change were the main factor explaining changes over time in the earnings behavior of married women.

6. Replicating the Eissa Results in the CPS

Because our results are directly at odds with the Eissa (1995) result, we set out to see if we could replicate her results using the same data and methodology that she used and determine why our results with the SIPP-SSA matched data differed from hers. Appendix tables I and II show that while we could not replicate her samples exactly, we match her basic results and summary statistics by income groups quite closely.[18] Note that her per-year samples of women in the high-income group are quite similar to the size of our SIPP samples – a bit over 225 per year. Standard errors are similar in the two sets of analyses – the reason why our TRA86 results are statistically significant and hers (in the opposite direction) are not is simply that our estimated impact is about twice as large.

Figure 10 shows the main findings from our reanalysis of the CPS data. It shows the fraction of women with positive annual earnings in each of the income groups based upon husband earnings and other (primarily asset) income. Women in the lowest income groups have the highest rates of labor force participation, so going from top to bottom the lines show the under 75th percentile group, the 75 th to 80th percentile group, the 80th to 90th group, the 90th to 95th group, the 95th to 99th group, and the over 99th percentile group.

It is clear that the CPS estimates of labor force participation for the 99th percentile group are very imprecise -- with the estimates fluctuating by any much as 10 percentage points from year to year. It is also clear that all of the groups had pre-existing upward trends in the early 1980s, trends that leveled off to various degrees around 1988. Thus any difference-in-differences comparison across these groups will represent some combination of differential underlying trends, different timing and degree of when the trends leveled off, and noise associated with sampling variation. Identifying effects of tax policy in this kind of environment will be quite challenging. In particular, Eissa-style difference-in-differences estimates will be quite sensitive to whether 1988 (an unusually low year for the 99th percentile group) is included as a post-TRA86 year or whether, instead, the post-TRA86 period is considered to begin in 1989 and therefore extends to include 1991 (an unusually high year). Eissa argues that it should begin in 1989 because

[18] Appendix A describes in detail our construction of our sample used for replicating the Eissa results.

some provisions in TRA86 were still being phased-in in 1988. Feldstein (1995) however conducts his TRA86 study comparing 1988 to 1985, as 1988 was the first year in which the top marginal rate was 28 percent. Table 8 illustrates more precisely the sensitivity of the results to choice of which TRA86 years are included. In specifications in which the post-TRA86 period starts in 1989 and includes 1991 there are, consistent with Eissa (1995), positive results. However, when the post-TRA86 period starts in 1988 and excludes 1991, the estimated impact is essentially zero. Table 9 shows that a similar pattern holds for earnings.

What happens when we apply Eissa's CPS-based methodology to OBRA 1993? In Figure 10, one can see that although labor force participation rates for the 99th percentile group are fluctuating widely, they are essentially flat from 1989 on. In contrast, labor force participation rates for wives in the 75th percentile and 90th percentile groups are continuing to rise. Difference-in-differences regressions will therefore show a decline for the high earners relative to the lower earners – consistent with what we saw in the SIPP-SSA match (figure 8). In this period, this result is also consistent with what would be predicted from the OBRA93 increase in marginal tax rates. In Tables 10 and 11, we show that the results for annual labor force participation are large and (for the 95th -90th comparison) often statistically significant, while the ones for earnings are not large enough to be statistically significant.

It is interesting to note that if one had simply set out to replicate the Eissa (1995) methodology for OBRA 1993 using the CPS and not examined the underlying trends more closely, one would have concluded that her results were strongly confirmed. A tax change for high earners in the opposite direction of the TRA86 reform had large effects on the labor supply of high-income wives -- in the direction predicted by the change in marginal tax rates. Under the assumption that the underlying trends that could not be sufficiently controlled for were similar (and in the same direction) in the two time periods this would be pretty strong confirmation.

We, however, come to a very different conclusion. First, we think we have established that none of the lower–earning groups are plausible control groups for the 99th percentile group. Second, we think the small samples of high earners are too noisy to draw any strong conclusions – results are sensitive to small changes in specification.

Third, we think the balance of the evidence suggests that the main thing happening for wives of high-earners was that because their husband's income was growing so rapidly in both the 1980s and 1990, the wives reduced their labor force activity relative to wives of lower-earners. Given how large the income effects appear to have been, we think distinguishing relatively modest tax impacts is impossible given that they could easily coincide in time with the larger changes in trends that were going on during this period.

The differences between our TRA86 married women results and those of Eissa remain a bit of a puzzle. We think the most likely explanation (besides sampling variation) is that the repeated cross-section analysis in Eissa resulted in different types of households (with different underlying propensities for female labor supply) being in the highest income group in the post TRA86 period than in the earlier period, something that we are able to avoid in our panel analysis. The potential problem of changing composition in the top income group with CPS data is exacerbated because the income data for a very large share of these households is top coded or imputed – making it impossible to know which income group they truly belong in. For example, Appendix Table IV shows that in the 99th percentile sample 75 percent of observations in the pre-TRA86 period and 69 percent of observations in the post-TRA86 period were affected by either top-coding or imputation. That said, we have looked at the industry and occupation distributions of the 99th percentile married men in the pre-1986 and post-TRA86 samples and do not detect any changes in the composition of the samples along these dimensions.

7. Policy Simulations

Our evidence so far finds little that would suggest that earnings elasticities would be large in response to an increase in the Social Security taxable maximum. However, we think there remains considerable uncertainty about what the relevant elasticities are. Table 12 demonstrates that narrowing the range of uncertainty about these estimates is critical to judging the desirability of an increase in the taxable maximum.

The table shows the results of simulations of the effects of raising the taxable maximum to cover 90 percent of all earnings (instead of 86 percent today) or to cover all earnings under different elasticity assumptions. The simulations are based on the 1996 earnings sample, but the results have been scaled to 2004 earnings levels to make the results useful to current policy discussions. The simulations are made under the standard assumption that workers bear the full burden of the payroll tax.[19] We also assume that the OASDI tax is perceived as a pure tax and that workers do not take into account the future increase in Social Security benefits that would follow from an increase in the covered earnings used to compute benefits.[20]

The first column shows the results of increasing the taxable maximum under the assumption that there are no behavioral responses to marginal tax rates. Under this assumption, mean gross earnings levels do not change when the fraction of the population subject to the OASDI payroll tax rises. However, the increase in the employer's share of the payroll tax (half of the total increase) will reduce the earnings net of employer payroll taxes one-for-one given our assumption that the burden is fully borne by workers. As a result, this will shrink the payroll tax base (as the payroll tax base is defined as earnings net of the employer share of payroll taxes) as well as the federal and state income tax base (as employer payroll taxes are not taxable under the federal and state income taxes). Thus, even with a zero labor supply elasticity, the actual increase in OASDI taxes when taking into account this incidence effect is actually a bit smaller than the static effect on OASDI taxes ignoring incidence. More importantly, the incidence effect will reduce the federal and state income tax base. On net, the increase in total government revenue is about 20% smaller than predicted by the static computation ignoring incidence effects when the cap is raised so that 90% of earnings are taxed. The revenue increase is about 25% smaller than the static prediction when 100% of earnings are taxed. Under the static estimates, OASDI revenue increases by 4.6 percent when 90 percent of earnings are taxed and by 16.2 percent when 100 percent of earnings are taxed. When netting out the

[19] As labor supply elasticities increase above zero, one might expect a portion of the incidence to shift to firms, reducing their profits and therefore the revenue from the corporate income tax. We ignore the complexity involved in modeling corporate tax effects by assuming that all of the incidence remains on the worker.

[20] Two arguments can be made to defend this second assumption. First, workers might be myopic or may not fully understand the link between the payroll tax base and future benefits. Second, high-income earners affected by the increase in the cap will most likely be in the third bracket of the benefits formula where benefits increase only by 15 cents per additional dollar of monthly earnings. Under reasonable assumptions for the market rate of return relative to average wage growth, the horizon before retirement, and life expectancy, an additional dollar of payroll tax would generate a PDV of benefits of less than 1/3 of a dollar. Thus, even under a perfectly rational model, the payroll tax change should be seen primarily as a tax increase.

effects on payroll and income tax revenue due to incidence, the total revenue increase is reduced to 3.7 and 12.4 percent respectively.

Under a compensated wage elasticity of 0.2 (and assuming an income effect of zero and again that the full incidence is borne by workers), mean earnings decline a bit when the payroll tax threshold is increased. Under the 90 percent of earnings scenario, the mean OASDI tax revenue (per earner) falls from $170 to $155. In addition, the decline in earnings reduces HI payroll taxes and federal and state income tax revenue by a total of $67 dollars. So the net revenue gain is only $88, only about half of the static predicted increase ignoring labor supply elasticity and incidence. In addition, there is now deadweight loss from the tax system (we measure payroll tax deadweight loss under the assumption that there is a pre-existing income tax). This deadweight loss increases by $58 per earner when 90 percent of earnings are taxed. Thus, to raise $88 of net revenue, we are reducing the well-being of the high-earners by $146. The results for the 100 percent of earnings tax case are similar.

With an elasticity of 0.5, the behavioral effects are much larger. In the 90 percent scenario, OASDI payroll tax revenue increases by only $136 and other tax revenue falls by $120 – so the net revenue gain is only $15. At the same time deadweight loss rises by $131. Thus there is $9 of deadweight loss for every dollar of revenue raised. Similarly, under the 100 percent scenario, the OASDI tax increase is almost exactly offset by the revenue decrease from the HI and income taxes. This shows that, with an elasticity of 0.5, the current tax system is close to the Laffer rate maximizing tax revenue for high incomes. Indeed, Saez (2001) shows that this Laffer rate can be expressed as $1/(1+a*e)$ where e is the elasticity and a is the Pareto parameter of the top tail of the earnings distribution. In the United States, a is about 2. With e=0.5, the Laffer rate is 1/(1+2*0.5)=50 percent. Removing the payroll tax cap would increase the top effective marginal tax rate on earnings (including a 7% state tax rate for high incomes) from (39.6+7+2.9)/(1+0.0145)=44 percent to (39.6+7+2.9+12.4)/(1+0.0765)= 53 percent, effectively crossing the top of the Laffer curve and hence generating very little extra revenue.[21]

[21] Saez (2001) shows, when deriving the optimal non-linear marginal tax rate formula, that the same Laffer rate formula applies when considering a local marginal tax rate increase exactly as in our 90% of earnings

With elasticities above 0.5, total federal revenue actually declines when we raise the taxable maximum as the reform would push the tax system above the Laffer rate maximizing tax revenue. In contrast, with an elasticity of 0.2, the Laffer rate would be .71.

8. Conclusion

We have presented new evidence on the earnings response to taxation so as to inform discussions about the likely effects of raising the Social Security taxable maximum. We have eight main findings. First, the workers who would experience an increase in marginal tax rates from an increase in the taxable maximum are mostly married males – a group thought to have relatively small elasticities. There are, however, a significant number of self-employed workers among this population which could suggest somewhat higher responsiveness. Second, the recent empirical evidence showing large behavioral responses to taxation is largely irrelevant to this question as it mostly focuses on broader concepts of income for which elasticities are likely to be higher and on demographic groups such as wives of high earners that are not particularly common in the subset of the population whose incentives would be altered by an increase in the taxable maximum. In the few studies that have also focused on narrower concepts, elasticities fall dramatically when the tax base is something closer to earnings. Third, the earnings distribution of workers around the current taxable maximum is inconsistent with a model in which people are highly responsive to the payroll tax rate. Fourth, this is true even for the self-employed, a group that is often thought to have significant control over its reported earnings. Fifth, in panel data on high-earnings married men, we see a tremendous increase in earnings over the 1980s and 1990s, but no break in the trend around the TRA86 or OBRA93 tax acts. Sixth, the rise in earnings for the high earners is so much greater than for other income groups that it seems completely implausible that the other income groups could serve as reasonable control groups for the high earners. Seventh, the overall weight of our evidence does not support the Eissa (1995) finding of a large behavioral response to taxation by wives of high earners. Eighth, we think there

taxes scenario. This explains why the revenue consequences (relative to the static prediction) are so close under the 90% and 100% scenarios we consider.

remains considerable uncertainty about the relevant elasticities for high earners – uncertainty that will be very difficult to eliminate without much larger samples of such taxpayers than are available outside the U.S. Treasury. Our policy simulations suggest that with an earnings elasticity of 0.5, lost income tax revenue and increased deadweight loss would swamp any benefits from the increase in payroll tax revenue. In contrast, with an elasticity of 0.2, the ratio of the gain in OASDI revenue to lost income tax revenue and deadweight loss would be much greater. Thus, knowing whether the elasticity is closer to 0.2 (or below) versus 0.5 is critical to deciding on whether this would be a wise policy.

Appendix A
Description of Eissa Replication Sample Creation

Basic Sample

Our replication data set is created using the 1983-1986 and 1989-1992 March Annual Demographic Supplements to the CPS which correspond to the calendar years 1982-1985 and 1988-1991, respectively. The first row of Appendix Table III presents the total number of CPS sample individuals for each calendar year, ranging from about 145,000 in 1988 to about 163,000 in 1982. In order the explore the sensitivity of the results to the choice of which years to include in the pre and post TRA86 sample, our data set includes two calendar years, 1982 and 1988, that were not used by Eissa.

Following Eissa (1995), we create a sample of married females from 20 and 64 years old, dropping individuals who are outside the age range, male, or not married. This creates annual samples of married women with between 27,500 and 31,568 observations. We merge husband characteristics into our file, using the CPS spouse line number variable. Then, we follow Eissa (1995) in dropping observations in which the wife was self-employed, disabled, or had 4160 or more annual hours of work as well as observations where the husband had zero hours.[22] The resulting annual sample sizes are displayed in the last row of Appendix Table III.

Sorting Families into Income Groups

Families are grouped into "tax filing units" consisting of the husband, wife, and any dependent children. Taxable sources of income for the family are aggregated. Income earned by children is excluded. Income is adjusted to 1985 dollars using the CPI-U. We sort on "other household income" which is total income minus the wife's wage and salary income. For each calendar year, the sample is then divided into income percentiles based on other household income. Because all of Eissa's analysis appears to be unweighted, the income percentiles are calculated without using weights. We have redone all of the Eissa replication using CPS person weights and the results are little changed.

Labor Force Participation Rate

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[22] We give our exact definitions for each of these sample exclusion criteria in the Appendix Table III notes. In several cases, the details in Eissa (1985) were not sufficient for us to know for sure how she defined her variables. For example, Eissa reports that she excludes women whose husbands were unemployed during the previous year, but we do not know whether she used an hours restriction or an earnings restriction or both. Similarly, we are not sure whether she excludes women with self-employment earnings based on business earnings only or both business and farm earnings. Finally, she also reports (p. 15) that she excludes observations with missing information, but we do not know which variables this applies to. We do not drop any further observations besides those listed in Appendix Table III.

Eissa defines labor force participation using a dummy variable equal to 1 if a woman reported working at least one hour during the year, even if she reported no earnings. She constructs annual hours of work as the product of “usual hours worked per week last year” and “weeks worked last year.” In our replication, we follow Eissa’s definition. To be more consistent with our earnings based analysis of the SIPP-SSA data, we have also redone our Eissa replication results using an earnings based definition of annual labor force participation. The results are nearly identical.

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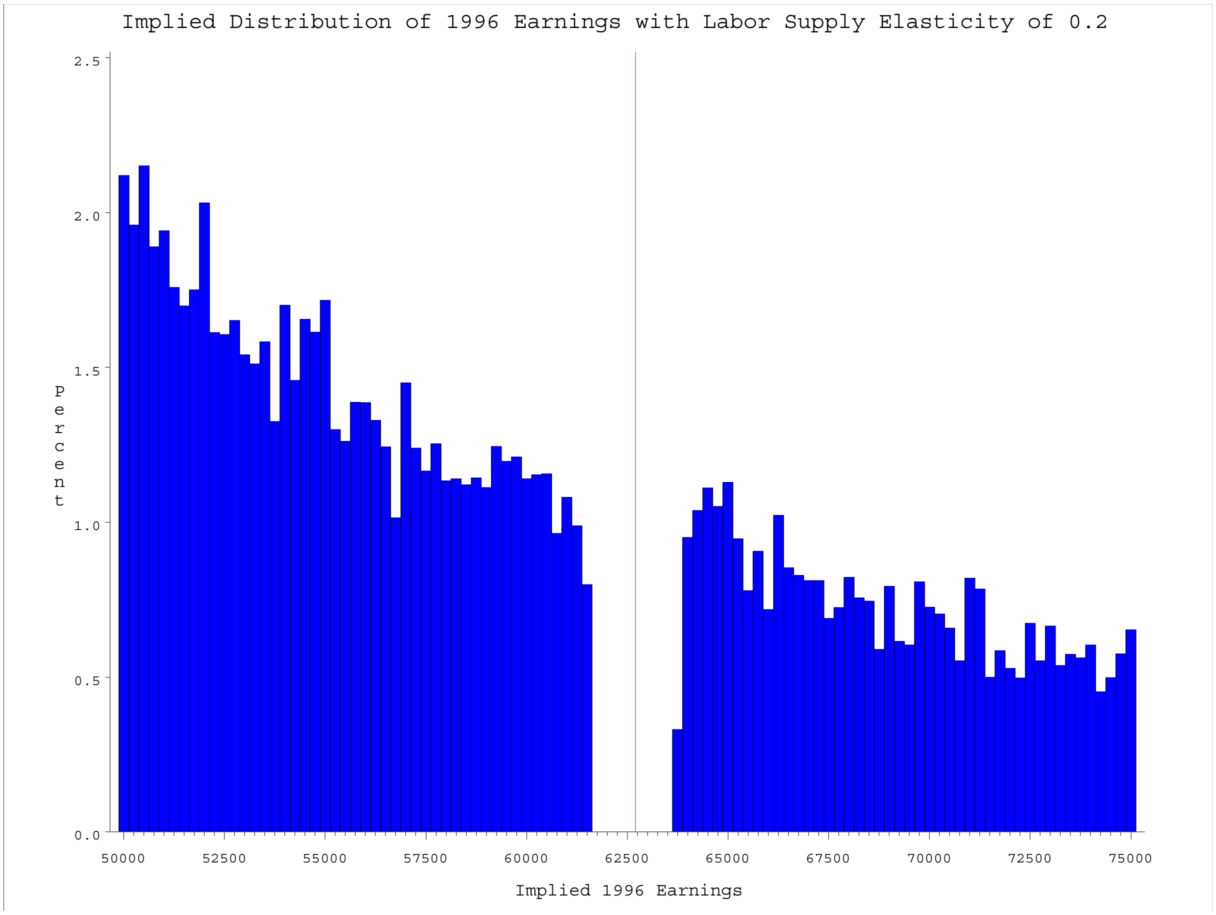
Figure 1


Implied Distribution of 1996 Earnings with Labor Supply Elasticity of 0.2
Percent
0.0
0.5
1.0
1.5
2.0
2.5
50000
52500
55000
57500
60000
62500
65000
67500
70000
72500
75000
Implied 1996 Earnings

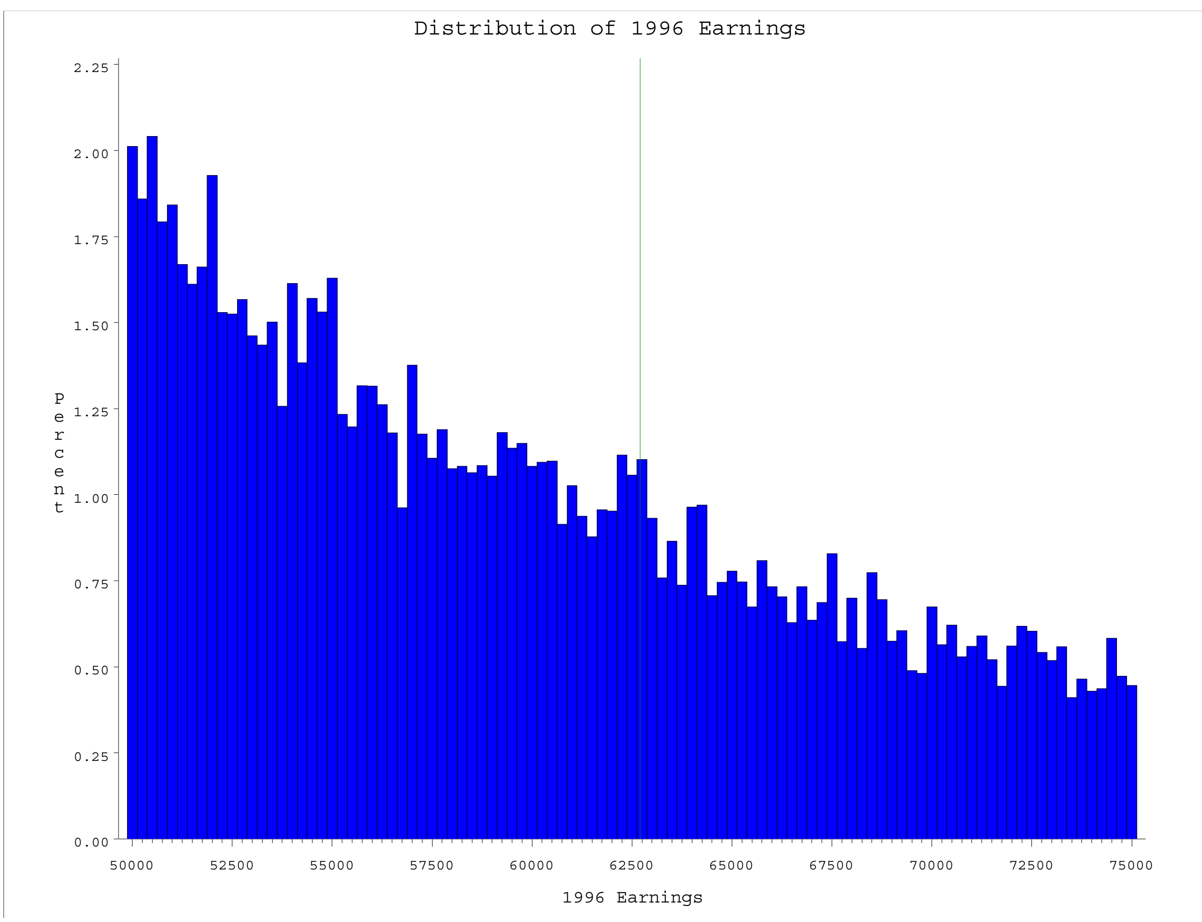
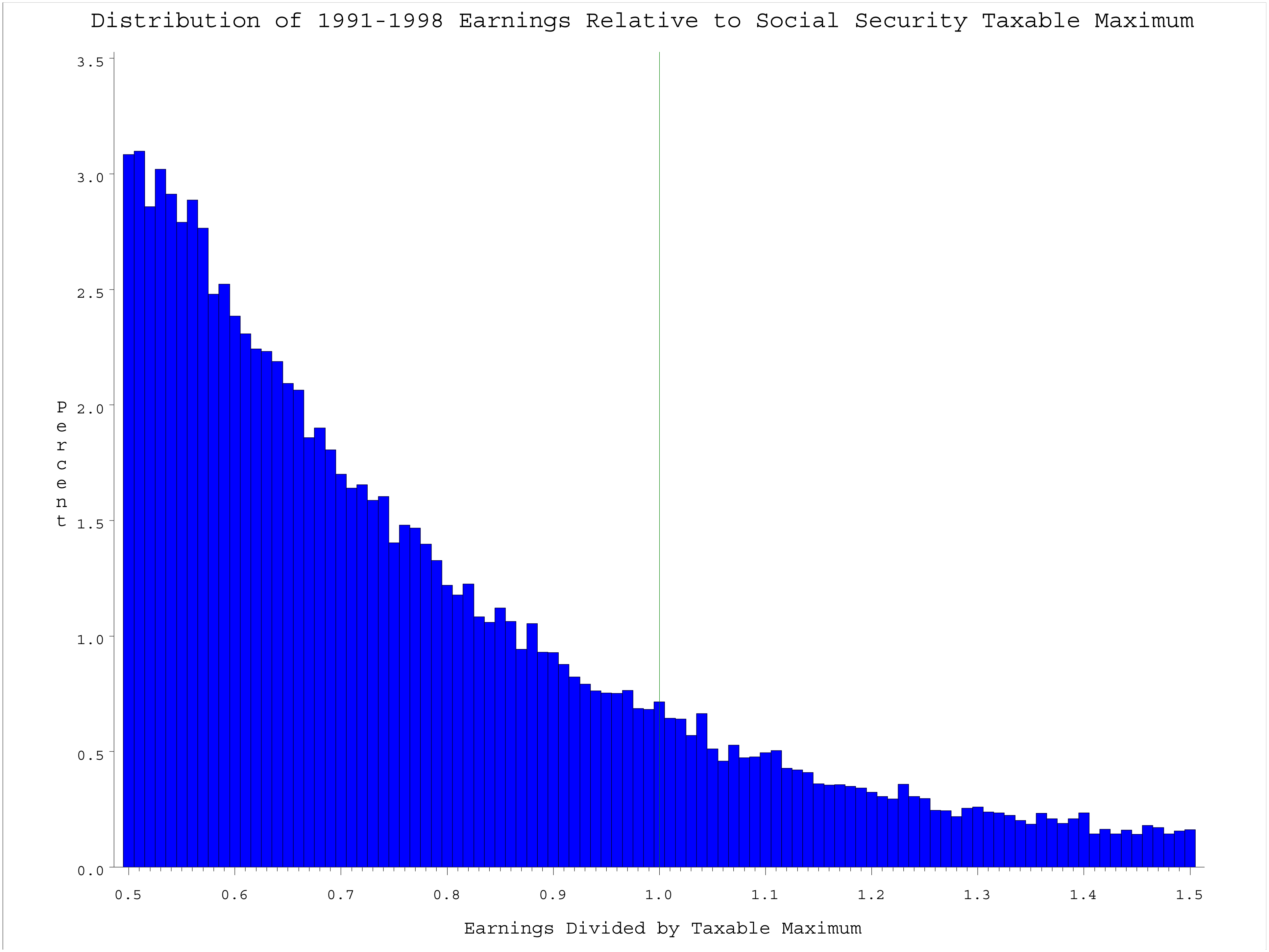
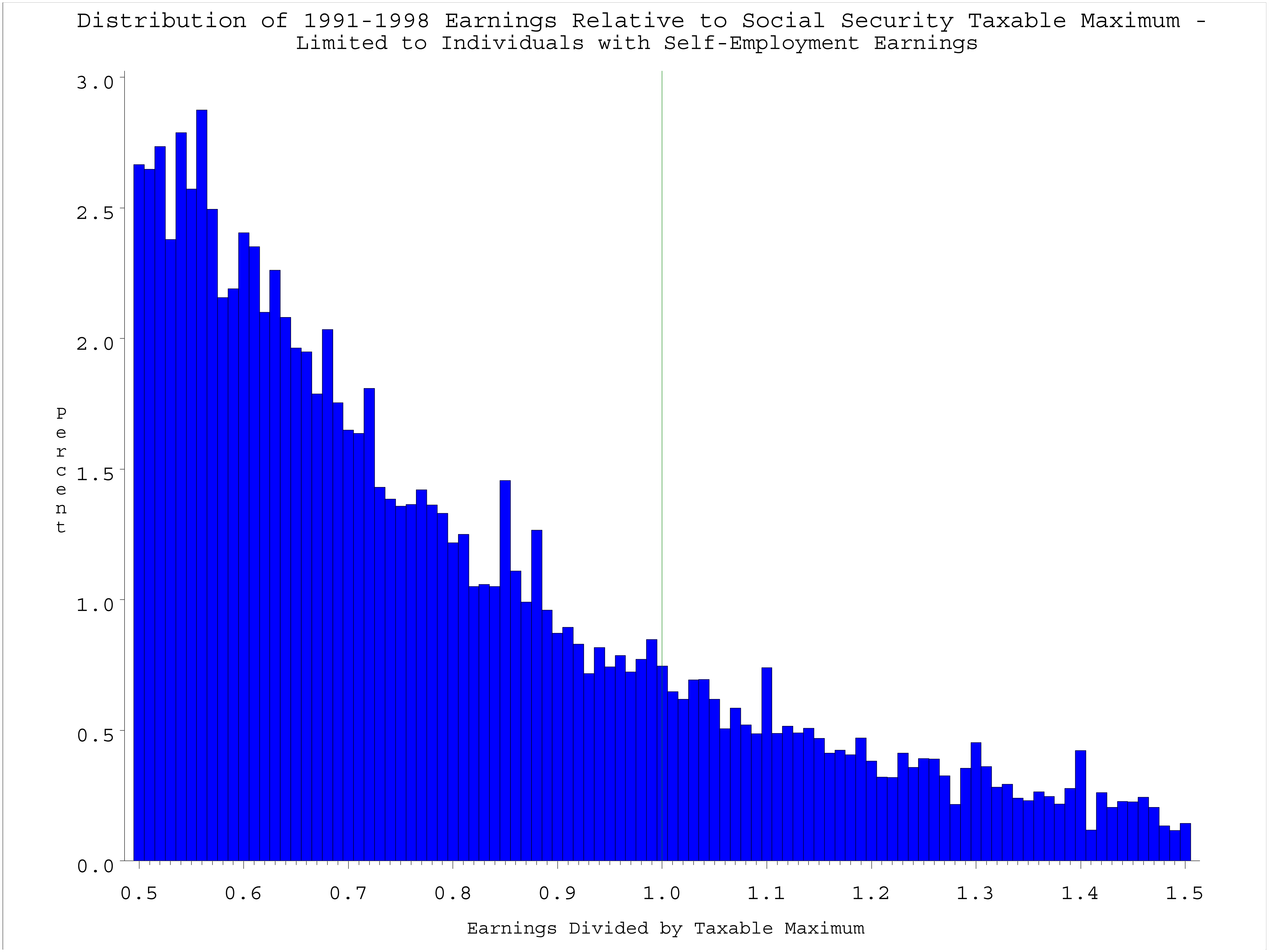

Distribution of 1996 Earnings
Percent
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
50000
52500
55000
57500
60000
62500
65000
67500
70000
72500
75000
1996 Earnings

Figure 2



Distribution of 1991-1998 Earnings Relative to Social Security Taxable Maximum
Percent
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
1.5
Earnings Divided by Taxable Maximum

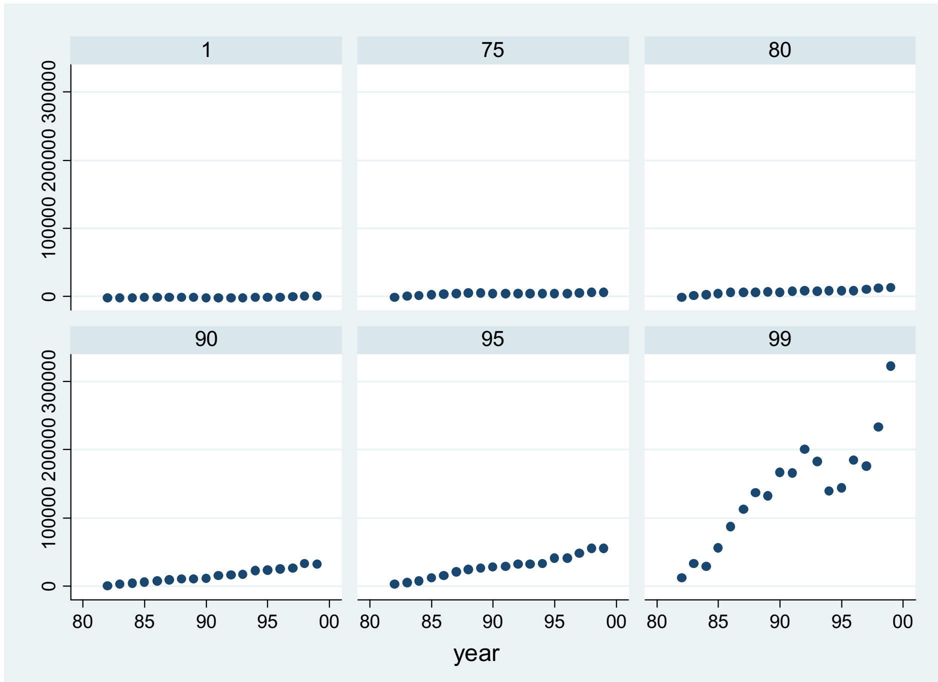
Figure 3



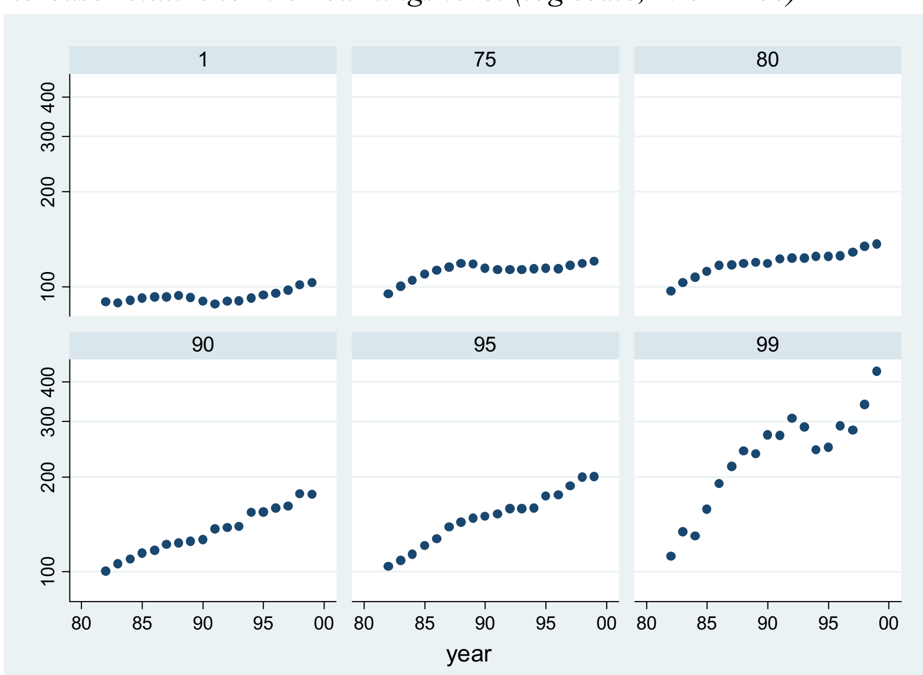
Distribution of 1991-1998 Earnings Relative to Social Security Taxable Maximum -
Limited to Individuals with Self-Employment Earnings
Percent
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
1.5
Earnings Divided by Taxable Maximum

Figure 4
Mean Change in Earnings Relative to 1981 for Married Men in TRA86 SIPP-SSA Sample by Earnings Group

Dollar Increase



Increase relative to 1981 earnings level (log scale, 1981=100)



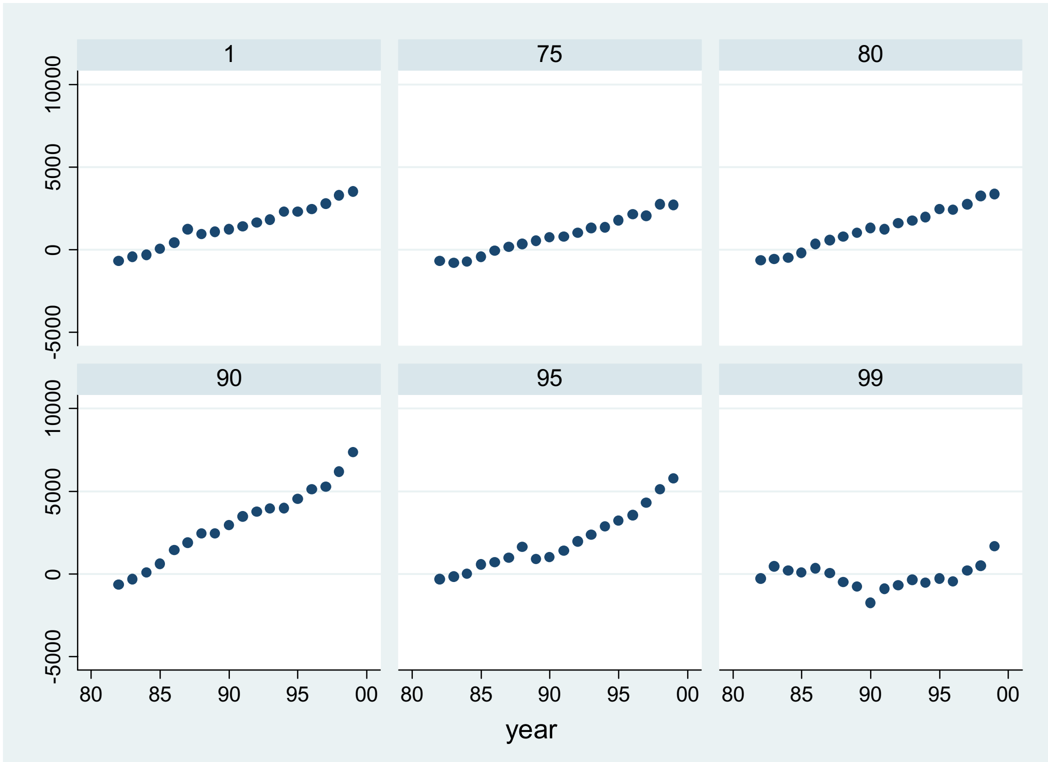
Notes: Groups are based on husband's average earnings from 1983 to 1991. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of earnings on year dummies and fourth degree polynomials for husband's and wife's age.

Figure 5
Change Relative to 1981 in Fraction of Wives with Positive Annual Earnings
by Earnings Group in TRA86 SIPP-SSA Sample

Notes: Groups are based on husband's average earnings from 1983 to 1991. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of labor force participation indicator on year dummies, fourth degree polynomials for husband's and wife's age, and an indicator for whether the husband had positive annual earnings in the year.

Figure 6
Mean Change in Earnings Relative to 1981 for Wives in TRA86 SIPP-SSA Sample by Earnings Group

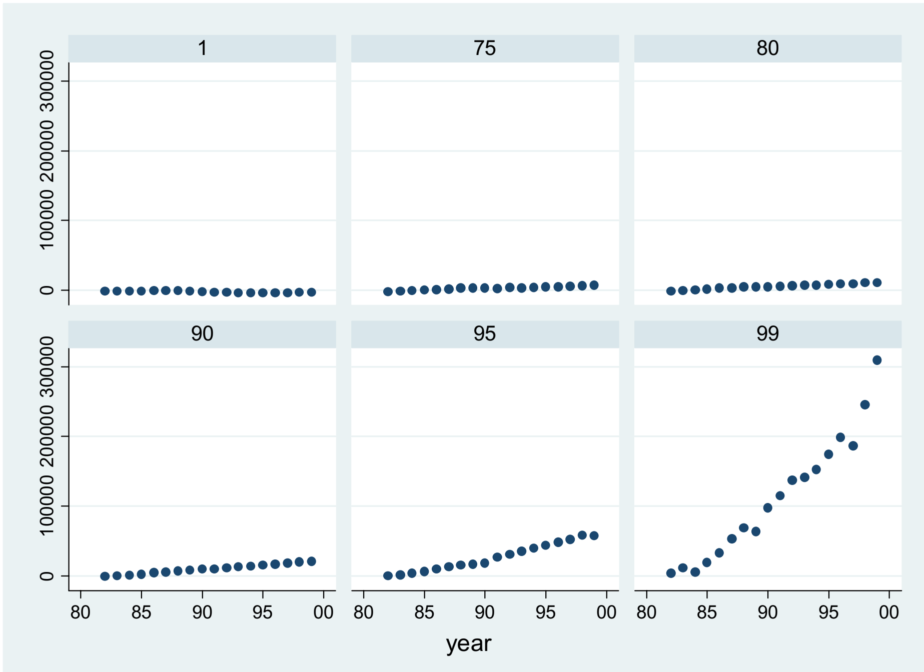
Dollar Increase



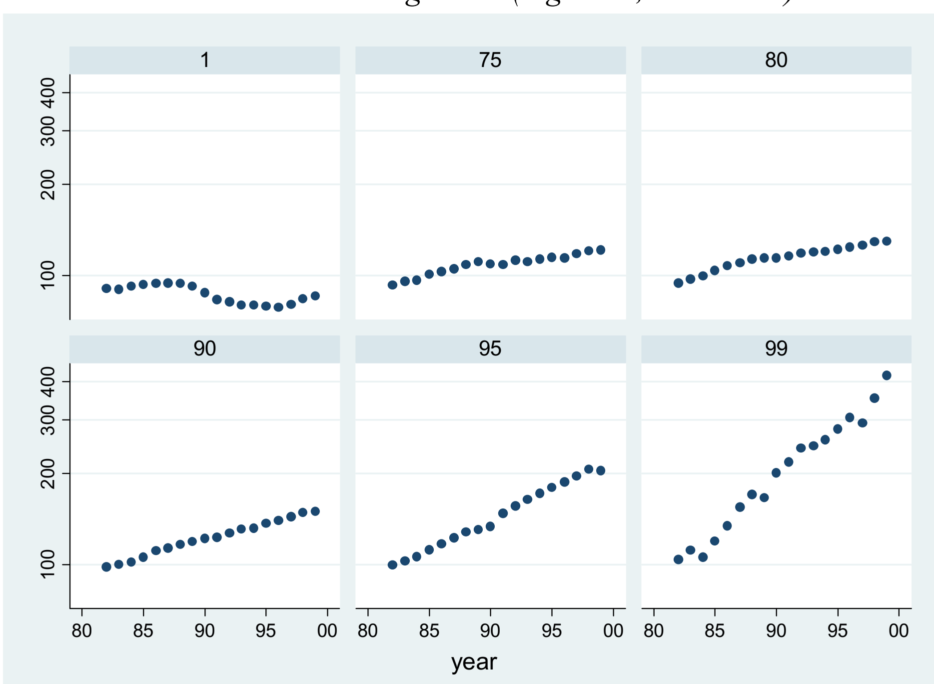
Notes: Groups are based on husband's average earnings from 1983 to 1991. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of earnings on year dummies, fourth degree polynomials for husband's and wife's age, and an indicator for whether the husband had positive annual earnings in the year.

Figure 7
Mean Change in Earnings Relative to 1981 for Married Men in OBRA93 SIPP-SSA Sample by Earnings Group

Dollar Increase



Increase relative to 1981 earnings level (log scale, 1981=100)



Notes: Groups are based on husband's average earnings from 1990 to 1998. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of earnings on year dummies and fourth degree polynomials for husband's and wife's age.

Figure 8
Change Relative to 1981 in Fraction of Wives with Positive Annual Earnings by Earnings Group in OBRA93 SIPP-SSA Sample

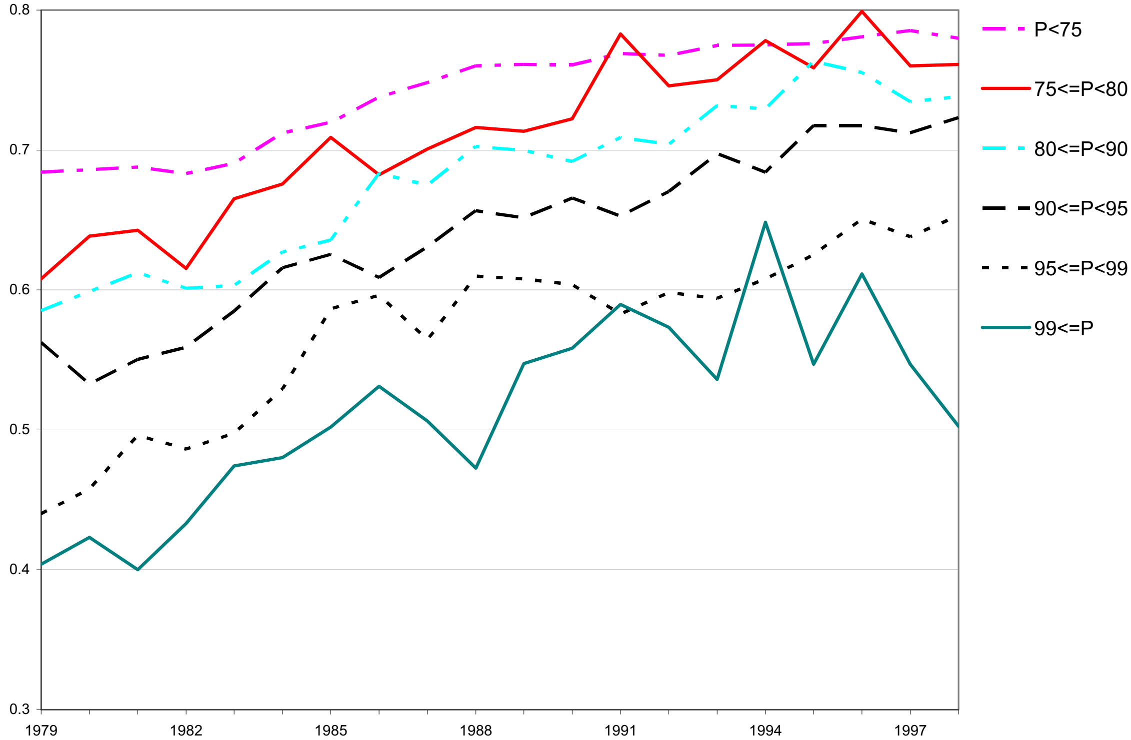
Notes: Groups are based on husband's average earnings from 1990 to 1998. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of labor force participation indicator on year dummies, fourth degree polynomials for husband's and wife's age, and an indicator for whether the husband had positive annual earnings in the year.

Figure 9
Mean Change in Earnings Relative to 1981 for Wives in OBRA93 SIPP-SSA Sample by Earnings Group

Dollar Increase

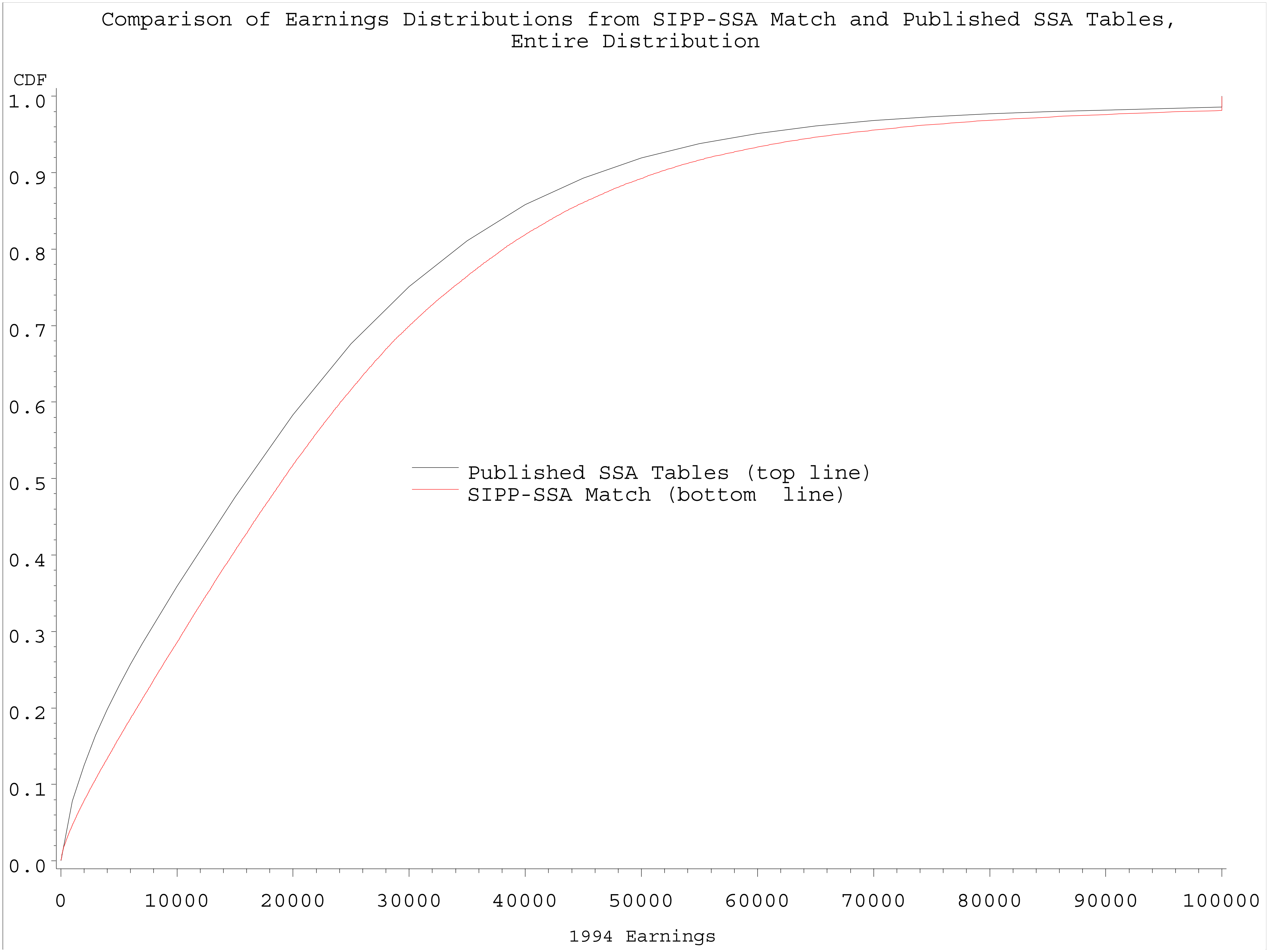
Notes: Groups are based on husband's average earnings from 1990 to 1998. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of earnings on year dummies, fourth degree polynomials for husband's and wife's age, and an indicator for whether the husband had positive annual earnings in the year.

Figure 10
Fraction of Married Women with Positive Annual Earnings by Income Group in March CPS



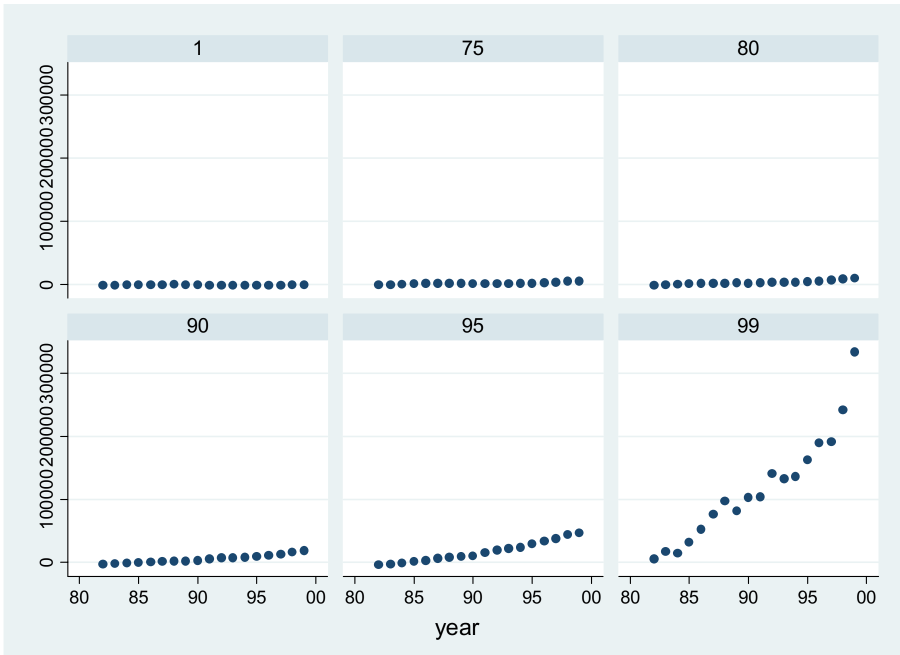
Notes: Groups are based on other household income (husband's earnings plus asset income) as described in Eissa (1995). Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th.

Appendix Figure 1



Appendix Figure 2
Mean Change in Earnings Relative to 1981 for Married Men in
Simulated Cross-Section Version of TRA86 SIPP-SSA Sample by Earnings Group

Dollar Increase



Increase relative to 1981 earnings level (log scale, 1981=100)

Notes: Groups are based on husband's average earnings from 1990 to 1998. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of earnings on year dummies and fourth degree polynomials for husband's and wife's age.

Appendix Figure 3
Change Relative to 1981 in Fraction of Wives with Positive Annual Earnings
by Earnings Group in Simulated Cross-Section Version of TRA86 SIPP-SSA Sample

Notes: Groups are based on husband's average earnings from 1983 to 1991. Group 1 <=75th percentile. Group 75 is >75th percentile and <= 80th percentile. Group 80 is >80th and <=90th. Group 90 is >90th and <=95th. Group 95 is >95th and <=99th. Group 99 is >99th. Estimates are coefficients on year dummies from regression of labor force participation indicator on year dummies, fourth degree polynomials for husband's and wife's age, and an indicator for whether the husband had positive annual earnings in the year.

Appendix Figure 4

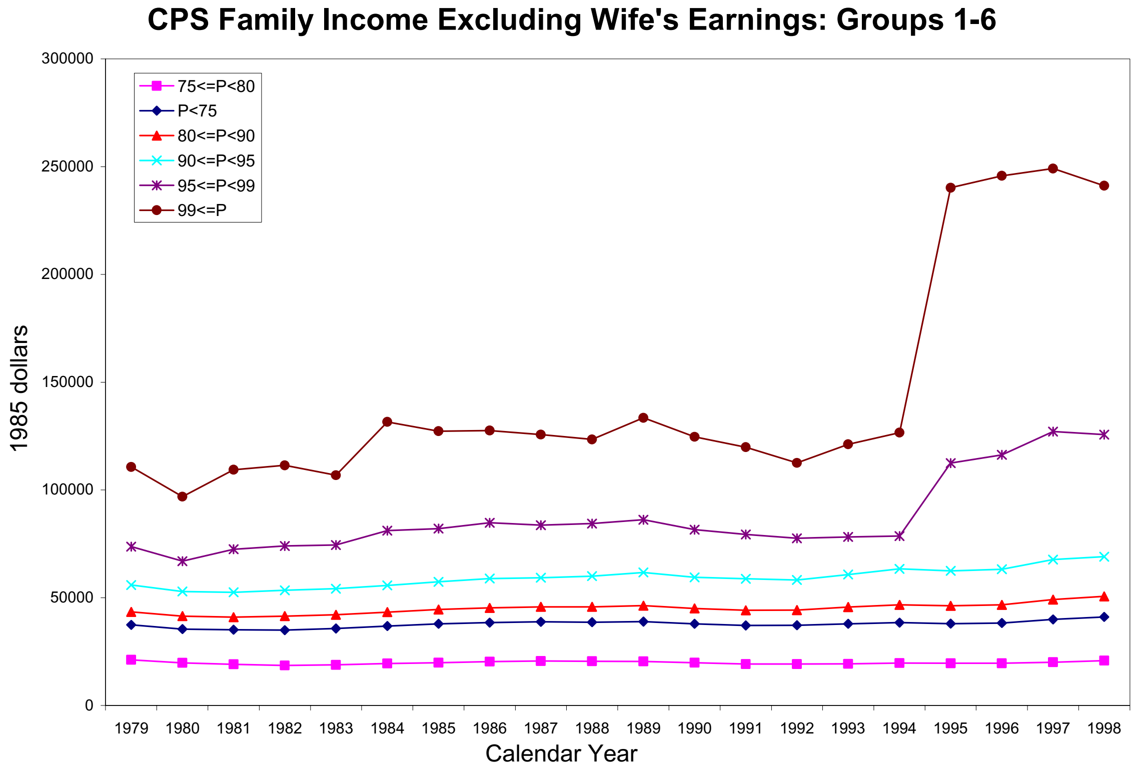


Table 1
Characteristics of Workers with Earnings Above and Below the Social Security Taxable Maximum

	Below current taxable maximum	Between current taxable maximum and 90% of covered earnings	Above 90% of covered earnings
Mean 1996 Earnings	$16,051	$71,869	$172,239
Mean Wages	$15,370	$67,296	$146,568
Mean Self Employment	$681	$4,573	$25,671
Mean Age	44.7	45.1	46.4
Percent Older than 54	26.2%	15.5%	18.3%
Percent Self Employed	7.4%	13.0%	23.8%
Percent Married Male	31.3%	68.3%	78.7%
Percent Unmarried Male	16.2%	12.6%	8.8%
Percent Married Female	33.6%	11.3%	8.9%
Percent Unmarried Female	19.0%	7.8%	3.6%
Percent White Collar	72.6%	82.6%	93.9%
Percent prime age male	30.5%	68.2%	69.7%
Percent prime age male not self employed	27.3%	59.2%	52.5%

Note: Data are from the 1996 panel of the SIPP-SSA match as described in the match. Earnings information, including mean wages, mean self employment and percent self-employed come from the administrative earnings records. The other variables come from the SIPP survey.

Table 2

Descriptive Statistics for the 1986 Tax Reform Sample

	75th Percentile	90th Percentile	99th Percentile
Percent of Wives with Positive Earnings (1982-1984)	68.2%	63.6%	51.6%
Percent of Wives with Positive Earnings (1983-1985)	68.4%	64.9%	53.5%
Percent of Wives with Positive Earnings (1988-1990)	73.8%	70.2%	49.6%
Percent of Wives with Positive Earnings (1989-1991)	74.9%	71.1%	49.9%
Average Wife Earnings (1982-1984)	$7,722	$7,803	$7,731
Average Wife Earnings (1983-1985)	$7,934	$8,211	$8,036
Average Wife Earnings (1988-1990)	$9,861	$10,916	$8,300
Average Wife Earnings (1989-1991)	$10,095	$11,291	$8,402
Average Husband Earnings (1982-1984)	$32,233	$45,339	$123,106
Average Husband Earnings (1983-1985)	$33,942	$47,607	$137,285
Average Husband Earnings (1988-1990)	$37,558	$53,660	$231,985
Average Husband Earnings (1989-1991)	$36,879	$55,163	$237,709
N	1199	1228	250

Note: Data are from the SIPP-SSA match described in the text. Earnings are adjusted to 1985 dollars using the Consumer Price Index. Percentiles are based on husband's average earnings from 1983-1989. 75th percentile is >75th percentile and <= 80th percentile. 90 percentile is >90th and <=95th. 99 percentile is >99th. Years are calendar years.

Table 3

Change in Wife Labor Force Participation: 1986 Tax Reform

Calendar years	99th Percentile - 90th Percentile no controls	99th Percentile - 90th percentile age covariates	99th Percentile -75th Percentile no controls	99th Percentile -75th Percentile age covariates
(1988-1990) –	-0.086	-0.094	-0.077	-0.079
(1982-1984)	(0.033)	(0.032)	(0.030)	(0.030)
(1988-1990) –	-0.091	-0.098	-0.093	-0.089
(1983-1985)	(0.031)	(0.030)	(0.028)	(0.029)
(1989-1991) –	-0.091	-0.100	-0.085	-0.083
(1982-1984)	(0.034)	(0.033)	(0.032)	(0.032)
(1989-1991) –	-0.097	-0.104	-0.101	-0.093
(1983-1985)	(0.032)	(0.032)	(0.030)	(0.030)

Notes. Data are from the SIPP-SSA match described in the text. Estimates are coefficients from regression of the change in the three-year mean of an indicator variable for positive annual earnings between the two periods shown on an indicator for whether the person was in the 99th percentile group. Percentiles are based on husband's average earnings from 1983-1989. 75th percentile >75th percentile and <= 80th percentile. 90 percentile is >90th and <=95th. 99th percentile is >99th. Regressions with age covariates contain a fourth degree polynominal in both husband and wife's age. Standard errors in parentheses.

Table 4

Change in Wife Earnings: 1986 Tax Reform

Calendar years	99th Percentile - 90th Percentile no controls	99th Percentile - 90th percentile age covariates	99th Percentile -75th Percentile no controls	99th Percentile -75th Percentile age covariates
(1988-1990) –	-2,544	-2,824	-1,569	-1,766
(1982-1984)	(691)	(686)	(592)	(595)
(1988-1990) –	-2,441	-2,688	-1,663	-1,751
(1983-1985)	(631)	(626)	(538)	(542)
(1989-1991) –	-2,817	-3,124	-1,701	-1,859
(1982-1984)	(765)	(758)	(651)	(655)
(1989-1991) –	-2,714	-2,988	-1,795	-1,844
(1983-1985)	(706)	(700)	(603)	(607)

Notes. Data are from the SIPP-SSA match described in the text. Estimates are coefficients from regression of the change in mean earnings between the two periods shown on an indicator for whether the person was in the 99th percentile group. Percentiles are based on husband's average earnings from 1983-1989. 75th percentile >75th percentile and <= 80th percentile. 90th percentile is >90th and <=95th. 99th percentile is >99th. Regressions with age covariates contain a fourth degree polynominal in both husband and wife's age. Standard errors in parentheses.

Table 5
Descriptive Statistics for the 1993 Tax Reform Sample

	75th Percentile	90th Percentile	99th Percentile
Percent of Wives with Positive Earnings (1990-1992)	77.1%	71.2%	48.3%
Percent of Wives with Positive Earnings (1991-1993)	77.1%	70.8%	47.6%
Percent of Wives with Positive Earnings (1995-1997)	78.3%	70.6%	47.5%
Percent of Wives with Positive Earnings (1996-1998)	78.1%	71.3%	48.5%
Average Wife Earnings (1990-1992)	$11,642	$12,069	$9,759
Average Wife Earnings (1991-1993)	$11,807	$12,291	$10,437
Average Wife Earnings (1995-1997)	$13,224	$13,432	$12,762
Average Wife Earnings (1996-1998)	$13,727	$13,977	$13,576
Average Husband Earnings (1990-1992)	$35,342	$54,333	$222,068
Average Husband Earnings (1991-1993)	$35,805	$56,092	$244,097
Average Husband Earnings (1995-1997)	$37,657	$61,583	$309,363
Average Husband Earnings (1996-1998)	$38,107	$62,954	$342,076
N	1493	1493	288

Note: Data are from the SIPP-SSA match described in the text. Earnings are adjusted to 1985 dollars using the Consumer Price Index. Percentiles are based on husband's average earnings from 1990-1998. 75th percentile is >75th percentile and <= 80th percentile. 90 percentile is >90th and <=95th. 99th percentile is >99th. Years are calendar years.

Table 6

Change in Wife Labor Force Participation: 1993 Tax Reform

Calendar years	99th Percentile - 90th Percentile no controls	99th Percentile - 90th percentile age covariates	99th Percentile -75th Percentile no controls	99th Percentile -75th Percentile age covariates
(1995-1997) –	-0.002	-0.012	-0.020	-0.024
(1990-1992)	(0.025)	(0.024)	(0.023)	(0.023)
(1995-1997) –	0.001	-0.004	-0.013	-0.013
(1991-1993)	(0.022)	(0.022)	(0.021)	(0.021)
(1996-1998) –	0.001	-0.009	-0.009	-0.009
(1990-1992)	(0.026)	(0.026)	(0.025)	(0.025)
(1996-1998) –	0.004	-0.001	-0.001	0.001
(1991-1993)	(0.024)	(0.024)	(0.023)	(0.023)

Notes. Data are from the SIPP-SSA match described in the text. Estimates are coefficients from regression of the change in the three-year mean of an indicator variable for positive annual earnings between the two periods shown on an indicator for whether the person was in the 99th percentile group. Percentiles are based on husband's average earnings from 1990-1998. 75th percentile >75th percentile and <= 80th percentile. 90th percentile is >90th and <=95th. 99th percentile is >99th. Regressions with age covariates contain a fourth degree polynominal in both husband and wife's age. Standard errors in parentheses.

Table 7

Change in Wife Earnings: 1993 Tax Reform

Calendar years	99th Percentile - 90th Percentile no controls	99th Percentile - 90th percentile age covariates	99th Percentile -75th Percentile no controls	99th Percentile -75th Percentile age covariates
(1995-1997) –	1,640	1,083	1,421	1,218
(1990-1992)	(906)	(902)	(828)	(835)
(1995-1997) –	1,184	759	908	842
(1991-1993)	(807)	(804)	(735)	(741)
(1996-1998) –	1,909	1,392	1,732	1,678
(1990-1992)	(1,076)	(1,073)	(882)	(888)
(1996-1998) –	1,453	1,068	1,219	1,303
(1991-1993)	(992)	(990)	(799)	(804)

Notes. Data are from the SIPP-SSA match described in the text. Estimates are coefficients from regression of the change in mean earnings between the two periods shown on an indicator for whether the person was in the 99th percentile group. Percentiles are based on husband's average earnings from 1990-1998. 75th percentile >75th percentile and <= 80th percentile. 90th percentile is >90th and <=95th. 99th percentile is >99th. Regressions with age covariates contain a fourth degree polynominal in both husband and wife's age. Standard errors in parentheses.

Table 8

CPS Change in Wife Labor Force Participation: 1986 Tax Reform

Calendar years	99th Percentile-90th Percentile no controls	99th Percentile-75th Percentile no controls
(1988-1990) –	-0.006	-0.000
(1982-1984)	(0.028)	(0.027)
(1988-1990) –	-0.007	-0.008
(1983-1985)	(0.028)	(0.027)
(1989-1991) –	0.032	0.015
(1982-1984)	(0.028)	(0.027)
(1989-1991) –	0.031	0.023
(1983-1985)	(0.028)	(0.026)

Notes. Data are from March Current Population Surveys from years following the indicated calendar years. Estimates are coefficients and standard errors on group99*post reform interaction term in a difference in differences regression.

Table 9

CPS Change in Wife Earnings: 1986 Tax Reform

Calendar years	99th Percentile-90th Percentile no controls	99th Percentile-75th Percentile no controls
(1988-1990) –	-547	93
(1982-1984)	(828)	(726)
(1988-1990) –	-365	466
(1983-1985)	(853)	(750)
(1989-1991) –	756	970
(1982-1984)	(851)	(751)
(1989-1991) –	938	1,342
(1983-1985)	(875)	(774)

Notes. Data are from March Current Population Surveys from years following the indicated calendar years. Estimates are coefficients and standard errors on group99*post reform interaction term in a difference in differences regression.

Table 10

CPS Change in Wife Labor Force Participation: 1993 Tax Reform

Calendar years	99th Percentile-90th Percentile no controls	99th Percentile-75th Percentile no controls
(1995-1997) –	-0.056	-0.029
(1989-1991)	(0.029)	(0.027)
(1995-1997) –	-0.058	-0.027
(1990-1992)	(0.029)	(0.027)
(1996-1998) –	-0.072	-0.045
(1989-1991)	(0.029)	(0.027)
(1996-1998) –	-0.075	-0.043
(1990-1992)	(0.029)	(0.027)

Notes. Data are from March Current Population Surveys from years following the indicated calendar years. Estimates are coefficients and standard errors on group99*post reform interaction term in a difference in differences regression.

Table 11

CPS Change in Wife Earnings: 1993 Tax Reform

Calendar years	99th Percentile-90th Percentile no controls	99th Percentile-75th Percentile no controls
(1995-1997) –	-1,374	-347
(1989-1991)	(1,511)	(1,328)
(1995-1997) –	-1,475	-1,004
(1990-1992)	(1,550)	(1,355)
(1996-1998) –	-1,287	-371
(1989-1991)	(1,601)	(1,363)
(1996-1998) –	-1,388	-1,028
(1990-1992)	(1,640)	(1,390)

Notes. Data are from March Current Population Surveys from years following the indicated calendar years. Estimates are coefficients and standard errors on group99*post reform interaction term in a difference in differences regression.

Table 12

Impact of Raising Taxable Maximum Under Different Earnings Elasticities

	Elasticity = 0.0	Elasticity = 0.2	Elasticity = 0.5	Elasticity = 0.8
Current System				
Mean Earnings	$34,214	N/A	N/A	N/A
Mean OASDI Revenue	$3,664	N/A	N/A	N/A
Mean Dead Weight Loss	$0	$806	$2,016	$3,226
90 Percent of Earnings Taxed				
Mean Earnings	$34,131	$34,029	$33,876	$33,724
Mean Dead Weight Loss	$0	$864	$2,147	$3,412
Static Δ in OASDI Revenue	$170	N/A	N/A	N/A
Δ in OASDI Revenue	$168	$155	$136	$118
Δ in HI Revenue	-$3	-$6	-$11	-$16
Δ in Federal Income Tax Revenue	-$25	-$53	-$96	-$138
Δ in State Income Tax Revenue	-$3	-$8	-$13	-$19
Total Δ in Tax Revenue	$136	$88	$17	-$55
100 Percent of Earnings Taxed				
Mean Earnings	$33,945	$33,591	$33,059	$32,529
Mean Dead Weight Loss	$0	$1,036	$2,524	$3,936
Static Δ in OASDI Revenue	$596	N/A	N/A	N/A
Δ in OASDI Revenue	$562	$517	$449	$381
Δ in HI Revenue	-$10	-$19	-$36	-$52
Δ in Federal Income Tax Revenue	-$88	-$199	-$365	-$532
Δ in State Income Tax Revenue	-$11	-$26	-$49	-$70
Total Δ in Tax Revenue	$454	$272	$0	-$272

Notes: Results are scaled to match 2004 earnings levels under assumption that 86 percent of earnings are below the maximum taxable earnings level.

Appendix Table I
Replicating Eissa (1995) Results

A. Eissa (1995) Results			
	Before TRA86*	After TRA86*	Change
High	0.464	0.554	0.090
Obs	756	718	
75th Percentile	0.687	0.740	0.053
Obs	3799	3613	
90th Percentile	0.611	0.656	0.045
Obs	3765	3584	

B. Replication of Eissa (1995) Results			
	Before TRA86*	After TRA86*	Change
High	0.486	0.565	0.080
Obs	750	717	
75th Percentile	0.683	0.740	0.056
Obs	3732	3629	
90th Percentile	0.609	0.657	0.048
Obs	3732	3582	

* Before TRA86 is 1983-1985; after TRA86 is 1989-1991. Data are from 1984-1986 and 1990-1992 March CPS.

Appendix Table II
Replicating Eissa (1995) Summary Statistics

A. Eissa (1995) Summary Statistics			
	High	75th Percentile	90th Percentile
Age	47.6	40.6	42.9
Education	14.8	13.3	14.1
Preschool Children	0.18	0.35	0.31
Family Size	2.88	3.21	3.18
Other Household Income	122,790	37,223	57,386
Hours	696	1092	939

B. Replication of Eissa (1995) Summary Statistics			
	High	75th Percentile	90th Percentile
Age	47.7	40.6	42.9
Education	14.8	13.4	14.2
Preschool Children	0.18	0.35	0.32
Family Size	2.77	3.12	3.08
Other Household Income	123,923	37,381	57,876
Hours	738	1092	945

Notes: Data are from 1984-1986 and 1990-1992 March CPS.

Appendix Table III

Details of Eissa Replication Sample

Calendar Year	1982	1983	1984	1985	1988	1989	1990	1991
Total CPS obs	*162,635*	*161,167*	*161,362*	*157,661*	*144,687*	*158,079*	*158,477*	*155,796*
Observations Dropped								
Age less than 20 or greater than 64	69,897	68,754	68,475	66,894	61,446	66,777	67,040	65,646
Males	44,704	44,452	44,517	43,676	40,163	43,960	43,980	43,489
Unmarried females*	16,466	16,733	17,243	16,907	15,578	17,601	18,070	17,905
Subtotal								
Married females between 20 and 64 years old, inclusive	*31,568*	*31,228*	*31,127*	*30,184*	*27,500*	*29,741*	*29,387*	*28,756*
Further Dropped Observations								
Total additional dropped**	6,186	6,127	5,972	5,765	5,535	5,456	5,410	5,380
Wife self-employed***	1,874	1,869	1,852	1,765	1,998	2,158	2,090	2,004
Wife was disabled****	674	611	563	542	509	620	588	588
Husband not working*****	3,944	3,973	3,875	3,722	3,306	2,989	2,979	3,055
Wife had excessive hours******	62	26	39	45	46	44	53	40
Total obs remaining in sample	*25,382*	*25,101*	*25,155*	*24,419*	*21,965*	*24,285*	*23,977*	*23,376*

*An individual is considered unmarried if she is widowed, divorced, separated, never married, or her spouse is absent.
**Total additional dropped does not equal the sum of the subcategories because the subcategories are not mutually exclusive.
*** Wife is considered self-employed if she had business or farm self-employment earnings.
****An individual is considered disabled if she selected "disabled or sick" for the main reason she did not work last year.
*****Husband is not working if husband's weeks worked last year or husband's usual hours worked per week last year equal zero.
******Females working greater than or equal to 4,160 annual hours of work.

Appendix Table IV

Share of Observations Affected by CPS Income Top Coding or Imputation

	All		99		95		90	
	Pre-TRA86	Post-TRA86	Pre-TRA86	Post-TRA86	Pre-TRA86	Post-TRA86	Pre-TRA86	Post-TRA86
Share with Husband Earnings Level Top Coded	1.33%	2.56%	61.07%	59.55%	17.84%	49.13%	0.00%	0.00%
obs	*991*	*1835*	*458*	*427*	*533*	*1408*	*0*	*0*
Share with Other Income Component Top Coded	0.06%	0.05%	5.73%	5.16%	0.07%	0.03%	0.00%	0.00%
obs	*4*	*3*	*43*	*3*	*2*	*1*	*0*	*0*
Share with Any Income Component Top Coded	1.37%	2.59%	65.33%	62.62%	17.91%	49.16%	0.00%	0.00%
obs	*1025*	*1858*	*490*	*449*	*535*	*1409*	*0*	*0*
Share with Imputation of Wife's Earnings	10.11%	5.22%	10.27%	6.28%	12.25%	6.70%	11.33%	6.20%
obs	*7552*	*3740*	*77*	*45*	*366*	*192*	*423*	*222*
Share with Imputation of Husband's Earnings	17.36%	9.39%	23.33%	12.55%	25.74%	14.27%	22.11%	11.95%
obs	*12962*	*6729*	*175*	*90*	*769*	*409*	*825*	*428*
Share with Imputation of Husband's Earnings or Top Code of Any Income Component	18.36%	11.61%	74.93%	68.62%	37.83%	55.69%	22.11%	11.95%
obs	*13710*	*8318*	*562*	*492*	*1130*	*1596*	*825*	*428*
Total Obs	74675	71638	750	717	2987	2866	3732	3582

Notes: Pre-TRA86 is calendar years 1983-1985. Post-TRA86 is calendar years 1989-1991.
In pre-TRA86 years, the CPS dividend income category includes rental income.
Wife earnings include only wages and salaries; husband earnings include both self-employment and wage and salary earnings.
99, 95, and 90 refer to the income groups as defined in other tables notes.