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**Estimating Federal Income Tax Burdens
for Panel Study of Income Dynamics
(PSID) Families Using the National Bureau
of Economic Research TAXSIM Model**

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Abstract

The Panel Study of Income Dynamics (PSID) staff no longer provide users with estimates of the federal income tax burden of PSID families. This paper describes an alternative method of estimating the federal income tax burden of families in the PSID using the National Bureau of Economic Research TAXSIM package with currently available PSID variables. We show that mean and median tax burdens for the PSID population using the TAXSIM package are similar to tax burden values supplied by the PSID staff from 1980 through 1991, the last year the PSID staff provided such information. The major source of difference between our estimates and those of the PSID staff appears to be related to our simplified assumption that all tax units take standard deductions. This assumption is necessary because the PSID no longer provides basic information on taxpayers who itemize deductions.

Introduction

Prior to 1992 the Panel Study of Income Dynamics (PSID) provided estimates of federal income tax payments for each tax unit in a PSID family.¹ These estimates can be summed to the family level to arrive at a family federal income tax burden. Estimates of family tax burdens are used by researchers interested in measuring economic well-being based on a family's net-of-tax income.²

The PSID did not directly question its respondents about their federal income tax payments. Rather, PSID staff simulated these payments based on a set of questions on income, filing characteristics, filing status, and number of exemptions. Beginning in 1992, the PSID no longer provides these tax estimates and, even more important, beginning with the 1993 survey they do not gather information on filing status, itemization, or number of exemptions.³ Thus, even users with access to the PSID tax simulation program have trouble estimating federal income taxes because the PSID no longer provides many of the required input variables. This paper describes an alternative federal income tax estimation procedure that approximates the federal income tax burdens available in the PSID for the years 1980 through 1991 and that can be used with currently available PSID variables to estimate federal income tax burdens in subsequent years.

The outline of the paper is as follows. First, we discuss issues surrounding the estimation of income taxes and clarify terms that will be used throughout this paper. Next we talk briefly about the PSID tax simulation program and our alternative—the National Bureau of Economic Research (NBER) TAXSIM model. Then we discuss our methodology for creating and constructing TAXSIM input variables using PSID data. In this section we discuss the key

differences between our methods or assumptions and those used by the PSID staff. Finally, we compare the PSID tax estimates with the TAXSIM tax estimates and attempt to explain differences between the two estimates. We conclude that our TAXSIM estimates are a reasonable approximation to the PSID tax estimates for 1980 through 1991. The major source of difference in the two measures is caused by our simplifying assumption that all tax units take the standard deduction.

Definitions

The PSID is a longitudinal study and thus must use the individual as its unit of analysis for answering multi-period questions. However, in measuring the economic status of individuals it must be recognized that most people share resources with other coresident persons and thus have access to income that does not flow directly to them. For this reason a broader unit of analysis, such as a family or household, is used to collect information on income.⁴ Most researchers measure economic well-being based on a family or household's net-of-tax income, where such income is the sum of individual income for each sharing unit member. Individuals within sharing units are assumed to share resources equally.⁵

The PSID provides information on both family and individual income and resources. Both the PSID tax program and the National Bureau of Economic Research (NBER) TAXSIM program estimate the federal income taxes of tax units.⁶ What makes computing family income tax estimations difficult is that while families may share resources, families do not necessarily file taxes as families. It is possible that different groups within the family file taxes separately. For this reason, to calculate a family tax burden it is necessary to first determine the number of tax units in a family and to then estimate each tax unit's burden separately. To do this one not only has to assign those with income to the appropriate tax unit but also assign dependents—with

and without their own personal income—to the appropriate tax unit.⁷ In making our assumptions about tax filing units and dependent status, we follow the PSID convention. We assume the head and dependent spouse (regardless of whether the spouse has her own income source) are a single tax filing unit, each dependent with income (except the spouse) is a tax filing unit and every nondependent family member (this can include married or unmarried persons who are blood relatives) is a tax filing unit. Dependents without income are assigned to the tax unit of their provider. In this way every individual within a family is assigned to a tax unit either as head of a tax unit, as a dependent within a tax unit, or both. The tax liabilities of within-family tax units are then summed to obtain the family tax liability.

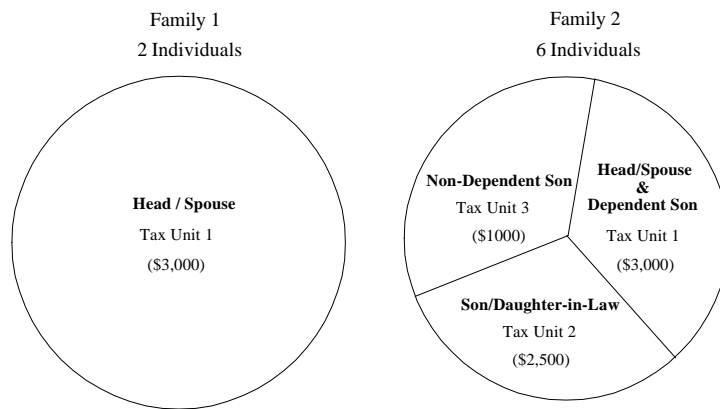
Each tax unit is assigned one of three possible tax filing statuses. All legally married couples are assumed to file taxes jointly and their tax filing status is defined as “married.”⁸ Together they file one joint tax return that captures the joint income of the married couple. Thus, married tax filing units can have one or two earners. The number of earners, however, is irrelevant because each married tax filing unit files only one joint tax return. We assume unmarried individuals with dependents file taxes as single persons and their tax filing status is defined as “head of household.” Finally, we assume unmarried individuals without dependents file taxes as single persons and their tax filing status is defined as “single.” Head of household or single tax filing units have only one income earner.

Multiple Tax Unit Families

Figure 1 shows how we treat families with more than one tax unit by describing two families. The first family includes two individuals and one tax unit. The second family includes six individuals and three tax units. The first family includes a married head and a spouse. These people file taxes jointly because they are married. As a married couple they file only one tax return and account for only one tax unit. The second family includes a married head and spouse

with income, an unmarried dependent son who has no income, a son and his spouse who have income, and another son with income who is unmarried and is not considered a dependent. As was the case in family one, the head and spouse with income in family two file their taxes jointly because they are married. As a married couple they file only one tax return and are considered one tax unit. Their unmarried son without income is considered a dependent of this tax unit and shares their tax burden. The married son and his spouse with income also file only one tax return and together are considered one tax unit. Finally the unmarried son with income, assuming he has no dependents, has a tax filing status of single, files one tax return, and represents one tax unit.⁹

Figure 1



Once the tax burden of each tax unit within the family is estimated, we aggregate them to arrive at a family tax burden. We then assign the family tax burden to each individual in the family. For the first family the tax payment for the tax unit is \$3,000. Because there is only one tax unit in this family, the family tax burden is also \$3,000. The head and wife each have a family tax burden equal to \$3,000. In the case of the second family where there are three tax units, we estimate the taxes for each of these tax units and then sum up tax payments for each tax unit to arrive at a total tax estimate for the second family. Tax payments are \$3,000 for tax unit 1

(containing the head, wife, and dependent son), \$2,500 for tax unit 2 (containing the other blood-related married couple), and \$1000 for tax unit 3 (containing the older nondependent single son). The family tax burden for the second family is \$6,500. Each of the six individuals in this family has a family tax burden equal to \$6,500.

This section briefly described our methodology for estimating federal income taxes and calculating family tax burdens. In the next section we provide a more detailed discussion of our method for estimating federal income taxes and the differences that exist between our assumptions and those used by the PSID staff.

The PSID Tax Simulation Program

The tax simulation program developed by the PSID staff estimates federal income taxes for tax units in the PSID using a number of variables available in the PSID data. The PSID tax program is divided into two parts. The first part of the program is written to compute a tax burden for the head and spouse of the family. The second part of the program computes tax burdens for all other individuals and couples in the family. This division is necessary because the PSID only interviews one member of each family—the head—and only asks detailed questions about the head and spouse. Although information is obtained from the head about other individuals in the family, this information is not very detailed and requires a different set of rules in order to estimate tax burdens. The PSID tax program computes taxable income and then estimates taxes for heads and wives based on tax filing status, number of exemptions, and amount of taxable income. These taxes are then adjusted by elderly and low-income tax credits. For other family members, taxable income is based on less detailed information about income sources and taxes are not adjusted for elderly and low income tax credits.

TAXSIM Model

The NBER TAXSIM model is a microsimulation program that estimates both federal and state taxes for the United States. The program uses information on income and deductions to estimate tax liabilities. For more information on the TAXSIM model itself see Feenberg and Counts (1993). While in this paper we compare the federal income tax burden estimates of the TAXSIM model with PSID tax program estimates, we have also calculated state income tax using the TAXSIM model as well as Social Security tax burdens for PSID families using our own programs. All these values are available upon request from the authors.

Estimating Tax Burdens in the PSID Using the TAXSIM Model

TAXSIM Input Variables

A number of input variables are required for the TAXSIM model. These variables are case identification number, tax year, state, tax filing status, number of dependent exemptions, number of age exemptions, wage and salary income, dividend income, other property income, pension, gross Social Security income, other transfer income, rent paid, property taxes paid, amount of itemized deductions, unemployment compensation, and child care expenses. Constructing most of the income variables is straightforward since much of the data are already available in the PSID. However there are a few variables, such as tax filing status—the correct tax unit to which members of the family belong—and number of dependent exemptions, whose construction is more complicated. Tables 1 and 2 list the input variables required for the TAXSIM model and the PSID variables we used. This section of the paper discusses the assumptions we made in order to create these variables and how these assumptions compare to those made in the PSID.

Marital Status

For income and tax purposes, the PSID considers two persons to be married if they have been living together for at least a year, regardless of their legal marital status. Legal marital status of heads and partners can be established using information provided in the PSID. However, this information is not available for other family members.

For the TAXSIM model we treat a nonmarried cohabiting head and his partner in the PSID data as two separate individual tax filing units rather than as members of a married tax filing unit. Federal and state tax laws do not permit nonmarried cohabiting individuals to file taxes jointly. For this reason we use information on legal marital status to assign individuals to tax units.¹⁰

Tax Filing Status

The PSID staff calculated tax burdens for married couples, household heads, and single person tax units. In the PSID tax program, each married couple is assumed to file one tax return that represents the couple's joint income, regardless of their legal marital status. Individuals are assigned a tax filing status of head of household if: they are unmarried, divorced, separated, widowed, or never married; and they have one or more dependent children or other dependent relatives living in the family; and they pay more than half the expenses of the family. Individuals who are unmarried (never married, divorced, separated, or widowed) and have no dependents are assigned a tax filing status of single. In our TAXSIM simulation we follow the PSID conventions of assigning persons to tax filing units with the one exception of cohabitants who are not legally married.

Itemization

Prior to 1984, the PSID did not ask the head whether he or she itemized deductions. Instead, they assumed that all homeowners with a mortgage itemized their deductions.

Depending on their level of taxable income, homeowners without a mortgage may or may not have been assigned the standard deduction.¹¹ From 1984 to 1992, the PSID asked the head whether he or she itemized deductions. For those who did not respond to the question, the likelihood of itemizing taxes and the amount of income itemized was estimated. The likelihood of itemizing taxes was calculated for renters, owners without mortgages, and owners with mortgages. For those who itemized their taxes, the amount of income itemized was estimated. To determine the amount of itemized deductions, the PSID used published statistics from the *IRS Statistics of Income—Individual Tax Returns*. In this publication the IRS reports the average fraction of income deducted by itemizers by income class.¹² For the purpose of the PSID tax program these individuals, as well as those who said they did not itemize, were assumed to have taken the standard deduction. In 1993 the PSID stopped asking individuals whether or not they itemized deductions.

The TAXSIM model requires information on the amount of itemized deductions. This variable was estimated by the PSID staff but never provided to users. Since the PSID no longer provides the variable indicating whether the head itemized his or her deductions, to continue to explicitly consider the consequences of itemization in our calculations we would have to both estimate the probability of itemizing and the amount itemized. Because we are not confident that our estimated values would provide good measures of the actual values, we assume that all tax units, including married tax units, take the standard deduction. This assumption will undoubtedly overestimate the actual tax burden of tax units who itemized their deductions. More discussion on how this assumption affects our estimates of federal income tax burdens is found below.

Dependents

The assignment of dependents is important for calculating the number of dependent

exemptions per tax unit and thus estimating taxes. The tax code allows tax units to reduce their taxable income for each dependent person they claim to support. The PSID rules for defining dependents in a tax unit are that family members who are not a head or spouse are considered dependents if they are less than age 16 and have an annual income of less than \$10,000 or older than 16 and have an annual income of less than \$5,000. All family members are looked at to determine whether they can be considered dependents. Once dependency is established, dependents are assigned to the appropriate tax unit. For tax purposes, dependents with their own income are assigned to their own tax units because they must file their own tax returns. However, because these individuals are dependents of their parents, they are still counted as exemptions within their parents' tax units. We use these same PSID rules, which approximate IRS rules, to determine dependent status in our TAXSIM estimates.

Taxable Income

The taxable income assigned to a tax unit is equal to the individual taxable income of the head of the tax unit for tax units whose tax filing status is single or head of household. For tax units whose tax filing status is married, the taxable income assigned to the tax unit is the sum of individual incomes for each married partner in the tax unit. This section discusses the components of individual taxable income in the PSID and the TAXSIM tax programs.

Because the PSID has less detailed information about other family members, the PSID tax program defines taxable income for heads and their partners differently than it does for other family members. For the head and partner, taxable income includes labor and asset income and is adjusted for alimony paid, retirement income (exclusive of Social Security and Veterans Administration pensions) received, unemployment compensation, and the taxable portion of Social Security benefits. For other family members, taxable income is the sum of earnings and assets; however, it is not adjusted for such things as alimony, retirement income, unemployment

compensation, and Social Security. Finally, it is important to note that income is reported retrospectively in the PSID. That is, individuals are surveyed about their previous year's income. Tax burdens are estimated to represent the previous year's federal income tax payments.

For the TAXSIM model, we replicate as closely as possible the PSID definition of taxable income. However, there is an important distinction in our treatment of earnings and assets. The PSID tax program includes both earnings and assets in its measure of taxable income; however, these incomes are not taxed differently from each other. Earnings and assets in the TAXSIM model are separated and taxed differently. Furthermore, unlike the PSID, we assign the labor part of farming and business income to earnings and the asset part of farming and business income to assets. The PSID documentation separates out these two income sources for farming and business income; however, in their tax program they lump these income into taxable income and apply the same tax rate to the total income. Because the TAXSIM model calculates state as well as federal taxes, information on transfer income, rent paid, property taxes paid, and child care expenses is required. However, because many of these variables are not available for all family members, these variables are set to zero for individuals other than the head and wife. As the PSID does, we estimate tax burdens to represent the previous year's federal income tax payments.

Changes in Family Composition

This section discusses the extent to which changes in family composition can affect the taxable income of a tax unit. Changes in family composition can have an important effect on measured economic well-being when calculating the previous year's taxable income. This is because in the PSID, as in most micro datasets, the interview year and the income year are not the same. In survey year t the PSID questions the head about income received in year $t-1$. Unlike the Current Population Survey micro dataset, for instance, in which income for the previous year

is captured only for those currently living in the family, the PSID tries to capture the income of all persons who lived in the current head's family in the previous year. Hence, not all individuals in the family at interview time period t were in the family at income time period $t-1$.

In cases where the current head's spouse moved out after the end of the tax year or the spouse died since the last interview, the head is assumed to file a married tax return but the spouse is treated as another family member in the interview. For tax purposes, the two incomes are added together and the tax is calculated using the married tax table. The tax is then divided proportionately to the incomes and is coded in the variables for the head's tax and the wife's tax. The PSID identifies individuals who married in the survey year but were not married in the previous year. The income for these individuals is coded jointly. However, they are not eligible to file taxes jointly. The tax for these persons is coded as the sum of their individual amounts and the marginal tax rate applied is the larger of the two amounts. Finally the PSID separates out other family members who were present in the family unit for only part of the tax year (previous survey year). For these individuals, the PSID records their incomes for the time they were in the family unit. Marginal tax rates are assigned and tax payments calculated using the part-year incomes.

Except for the rules applying to dependents, we assume that all individuals in the family at time t were in the family, and therefore in the tax unit, the entire year $t-1$. As Table 3 shows, this assumption is a reasonable approximation for most individuals. Only about 3 percent of persons in the PSID were not in their current family in the previous year. Below we show the importance of this simplifying assumption in our tax estimates.

Comparison of PSID and TAXSIM Tax Burdens

This section looks at the output of the PSID federal income tax simulation program and

the TAXSIM federal income tax program for the years 1980 through 1991 to identify differences between the two tax estimates and their possible causes. Because ultimately we are interested in how our measures of family tax burdens differ from PSID measures, in this section we consider tax payments of families and not of tax units. However, because concepts such as tax filing status, marital status, and cohabitation are individual and not family concepts, we consider the individual to be the unit of analysis. Therefore we look at the level of family tax payments for each individual in the family and assume that individuals share the resources equally.

Figures 2a and 2b compare the mean and median yearly estimated federal income tax burden of PSID individuals estimated by the PSID staff and our estimates using the TAXSIM model. These variables are weighted using the PSID yearly weights. In every year, the mean TAXSIM tax model values are higher than the mean PSID tax model values. The greatest differences occur in the years 1985 through 1987. However, the two tax estimates are closely parallel over time. Most importantly they both capture major increases in tax burdens in the 1985 survey year. The median tax burdens also appear to follow the same patterns over time and are closer together than are the mean values.

Marital Status

One possible explanation for the differences between the TAXSIM and PSID estimates is the difference in how we treated cohabiting individuals. In the PSID, cohabiting and married individuals are considered married for both income and tax purposes. For the TAXSIM estimates, where possible we distinguished married from nonmarried cohabiting individuals. Table 4 show how many individuals are affected this distinction. In 1980 there were 7,701 heads and partner, of whom 201, or 2.6 percent, were unmarried and cohabiting. By 1991, 6.6 percent of heads and partners were cohabiting. As discussed previously, we can identify legal marital status only for heads and partners in the PSID. Fortunately, few family members, other than the

head and partner, are either married or cohabiting. In 1980, only 62 other family members were married or cohabiting. This number grew somewhat between 1980 and 1985 and then shrank thereafter so that by 1991 it was 78.

Figures 3a and 3b depict the differences in mean and median family tax burdens for nonmarried cohabiting individuals using the two tax models. The PSID treated these individuals as married tax filers when they estimated their federal tax burdens. In the TAXSIM model these individuals are treated as single or head of household tax filers. As expected, the TAXSIM values are higher for these cohabiters in most years but the differences are small and this is a relatively small population. Hence, our change in this definition of tax filing status is not likely to be the cause of the overall differences in means and medians we observed in Figures 2a and 2b.

Tax Filing Status

It is possible that differences between TAXSIM and PSID tax estimates are caused by differences between individuals' assigned tax filing status in the PSID and our assignments. Because the PSID tax filing status variable is not available after 1992, we created our own tax filing status measure using variables that are available in the PSID after 1992. Table 5 examines the number of matches between our TAXSIM filing status variable and the PSID tax filing status variable. For most years, 90 percent of them are the same (sum of bolded percentages). In approximately 2 percent of all cases a mismatch occurs because we coded tax filing status as single for cohabiting heads and partners. In these cases we believe our tax filing status is the appropriate one to use.

Figures 4a and 4b capture differences between the mean and median TAXSIM tax model and PSID tax model estimates by tax filing status. As in the other figures, the TAXSIM and PSID estimates closely parallel each other between 1980 and 1991. In almost every year,

TAXSIM estimates are higher than PSID estimates for each filing group. Differences between the tax estimates are smaller for those whose tax filing status is head of household or single and largest for those whose tax filing status is married.

Itemization

One explanation for the differences between the TAXSIM and PSID estimates is that the PSID assumes married couples itemize taxes if the amount itemized is estimated to be larger than the standard deduction. For the TAXSIM estimation procedure, we assume that all tax units take the standard deduction. Because we assume that all tax units take the standard deduction, we overestimate taxes for tax units who actually itemized their deductions. Therefore, we expect the TAXSIM values to be higher than the PSID tax values for individuals in tax units who itemized their deductions. Itemizers in general are dominated by higher income individuals and those with larger stocks of assets, including homes.

Table 6 looks at the number of individuals in the PSID who are living in families where the head itemized deductions, took the standard deduction, or did not answer. In each year, between 39 and 48 percent of individuals are living in families where the head itemized deductions. Additionally nearly 1 percent of individuals are living in families where the head did not answer the itemization question. For these families, as mentioned earlier in the text, the PSID estimated the probability of itemization and the amount of income itemized. By assuming that everyone takes the standard deduction, we may be overestimating the taxes of about 40 percent of all individuals in the sample.

Figures 5a and 5b depict mean and median tax burdens by whether or not the individual is living in a family where the head is identified as itemizing taxes in the PSID data. Once again the analysis is weighted. Differences between the TAXSIM tax model and the PSID tax model estimates are smallest for the group of individuals living in families where the head takes the

standard deduction. In most years, these estimates are almost identical. For a number of families, the itemization variable was coded as missing. For individuals living in these families, the TAXSIM tax value is higher than the PSID tax value in every year, with the largest differences in 1985 and 1987 in Figure 5a. The 1985 spike in the graph appears to be due entirely to a few outliers in which the TAXSIM tax burdens are much larger than the PSID tax burdens. Figure 5b, which looks at median tax burdens instead of mean tax burdens, confirms this. In Figure 5b, the 1985 spike disappears. Finally, the largest differences between the TAXSIM model and PSID tax model estimates are, as we expected, for individuals living in families where the head itemized taxes. This difference between itemizers is not completely explained by outliers. Although the difference is smaller in Figure 5b than in Figure 5a, it is still large.

In Table 7 we disaggregate our standard deduction, itemizer, and missing groups by family income status. We assume that differences between the TAXSIM tax model and PSID tax model estimates will be largest for individuals living in high-income families because these individuals are more likely to itemize their deductions. In contrast, we expect the differences between the TAXSIM and PSID estimates to be smallest for individuals living in low-income families. In Table 7 we divide families by their position in the income distribution—bottom, middle, and top third—and show the percentage of individuals living in those families where the head itemized. In the low-income group, 80 percent of individuals take the standard deduction, while less than 20 percent of individuals itemize their deductions. Individuals in the middle-income group are more likely than those in the low-income group to itemize deductions. However, as we expected, between 80 and 89 percent of individuals in the high-income group are more likely than individuals in any other income group itemize deductions in every survey year.

Figures 6a and 6b compare mean and median federal income tax burdens using TAXSIM

tax model and PSID tax model estimates by income group for individuals living in families where the head took the standard deduction. The differences are very small for most years for all of the income groups, despite our simplified methodology.

In Figures 7a and 7b we look at tax estimates for individuals living in families where the head itemized deductions. We compare the yearly mean and median federal income tax burdens estimated with the TAXSIM tax model, which assumes everyone takes a standard deduction, with the PSID tax estimates which account for itemization. As in other figures, TAXSIM values are higher than PSID values for all individuals, regardless of income level. However, differences between the TAXSIM and PSID tax estimates are largest for those in the high-income group where the tax advantages of itemization are greatest and smaller for those in the low- and middle-income groups. This is exactly the result that we expected. While the differences in Figure 7b are smaller than in Figure 7a they are still sizable.

Figures 8a and 8b examine the mean and median tax burden for those individuals living in families where the head did not answer the itemization question. As discussed earlier, for these individuals the PSID estimated the probability and amount of itemization; we cannot be certain to whom the PSID assigned the standard deduction or the itemized deduction. The results show that once again the high-income group has the largest differences between the TAXSIM tax model and PSID tax model estimates. Tax estimates for the low- and middle-income groups are nearly identical in every year, except in 1985 in Figure 8a. In 1985 the mean TAXSIM tax model estimate for individuals in the low-income group is over \$30,000, while the average PSID estimates for these same individuals is less than \$5,000. However, this is mainly caused by a few outliers as is seen when the median values are compared in Figure 8b. The only major differences in the two figures are among high earners whom presumably PSID coded as itemizers.

Regression Estimations

Based on the simple cross-tabulations in the previous sections and our inability to identify itemizers, we suspect that our simplified tax burden estimates will overestimate taxes paid by tax units in the PSID. Despite our inability to capture itemization, however, we do not believe that we will greatly change the level or relative tax burdens as captured by the more complex PSID estimates. In this next section we use regression analysis to explain the causes of these measured differences.

Because we expect itemization to be the main cause of the difference in our estimated results, we first estimate our regressions for the entire sample with itemizations as an independent variable and then segment our sample by itemization. We use two alternative dependent variables to capture differences in our procedures. The first dependent variable is the difference between the TAXSIM tax model estimates and the PSID tax model estimates for an individual divided by the mean of the two estimates.

$$[(\text{TAXSIM} - \text{PSID}) / (\text{TAXSIM} + \text{PSID})/2]$$

The second dependent variable is the difference between the TAXSIM tax model estimates and the PSID tax model estimates for an individual divided by the individual's pre-tax income. The regressors represent age, tax filing status, income and income squared, education level, employment level, housing ownership, gender, the number of exemptions, race, the PSID oversample, region, and itemization. Table 8 lists the variables and their descriptions. The estimating equations are

$$\frac{Tax_T - Tax_P}{\left(\frac{Tax_T + Tax_P}{2}\right)} = \beta_0 + \beta_1 Age + \beta_2 Age^2 + \beta_3 Head + \beta_4 Married + \beta_5 IncomeY + \beta_6 Income^2 + \beta_7 HS + \beta_8 College + \beta_9 F_{(1)} + \beta_{10} Part + \beta_{11} Own + \beta_{12} Cohabit + \beta_{13} Gender + \beta_{14} Deductions + \beta_{15} Race + \beta_{16} Oversample + \beta_{17} Nc + \beta_{18} South + \beta_{19} West + \beta_{20} Itemization + \epsilon$$

and

$$\frac{(Tax_T - Tax_P)}{Pre\ Tax\ Income} = \beta_0 + \beta_1 Age + \beta_2 Age^2 + \beta_3 Head + \beta_4 Married + \beta_7 HS + \beta_8 College + \beta_9 Full + \beta_{10} Part + \beta_{11} Own + \beta_{12} Cohabit + \beta_{13} Gender + \beta_{14} Deductio_{(2)} + \beta_{15} Race + \beta_{16} Oversample + \beta_{17} North + \beta_{18} South + \beta_{19} West + \beta_{20} Itemization + \epsilon$$

Given the results in the previous sections, we expect itemization to be the key variable in the regressions.

Tables 9 through 11 describe regression results using equation (1). Between 1980 and 1983 the PSID did not ask whether the head itemized taxes and so this variable is not included in these regressions.

In all of these years, high school education and college education significantly increased the spread between the TAXSIM and PSID estimates. The same is true for homeowners. However, when itemization is included in the regressions for 1984 through 1991 these variables are not consistently significant. This suggests that all three of these variables were proxies for

itemization. Itemization is always positive and significant. The coefficients on all other variables fluctuate in terms of signs and significance and suggests no systematic pattern of differences in the TAXSIM and PSID tax program once itemization is controlled. Note that unmarried cohabitation, while treated differently in the two tax programs, does not have a significant effect on this difference.

Given the importance of itemization in Table 9, we ran the same regressions but separated out individuals according to whether the head of the family itemized on his or her tax return. The results of these regressions are described in Tables 10 and 11. Table 10 looks at individuals living in households where the head did not itemize. As in Table 9, there are no evident patterns of significance among any of the regressors. The coefficients on most variables are insignificant for most years.

Table 11 examines differences in tax estimates for individuals living in families where the head itemized deductions. In these regressions no variable is consistently significant across all years. However, more variables are significant, college education is significant in all but one year, and deductions are negative in all years and significant in most.

The next set of tables describes regression results when the dependent variable is defined as the difference between TAXSIM and PSID tax estimates divided by the average of these two tax estimates. These regressions include variables which describe the family's level of pregovernment income in each year. The regressions in Table 12 examine differences between TAXSIM and PSID estimates in each year. The results are similar to Table 9 in that itemization is the only consistently significant variable that, although head of household is consistently negative and usually significant. Income is included as an independent variable in this set of tables but does not have a constant pattern of signs or significance across years, even when itemization is not included in the regression.

Table 13 looks at individuals living in households where the head did not itemize.

Except for the negative and significant coefficients on head of household, there are no patterns apparent in significance and sign across the years.

Table 14 examines individuals living in households where the head itemized taxes. The pattern is the same as in Table 13 except that now income is usually negative and income squared positive and their variables are significant in the majority of years, indicating that at lower levels of income the PSID tax estimate is likely to be higher than the TAXSIM estimate and that at higher levels of income the TAXSIM estimate is likely to be higher than the PSID tax estimate.

Summary

The purpose of this paper is to describe a methodology for estimating federal income taxes using PSID data and the NBER TAXSIM model. Because our goal was to approximate the federal tax estimates provided in the PSID, whenever possible we applied the PSID methodology and used variables provided and constructed by the PSID. However, because a number of input variables required for the TAXSIM model are not available in the PSID after 1992, we needed to create these variables. In this paper we discussed how our assumptions differ from those used in the PSID tax program, we compared the PSID tax program estimates with the TAXSIM annual tax estimates, and we attempted to explain differences between the two estimates. Overall, the TAXSIM tax program yields tax estimates that are similar to those using the PSID tax program. The biggest differences between the two federal tax estimates are due to our assumption that all tax units take the standard deduction. The result is that we overestimate federal taxes for those tax units who would normally itemize their taxes. However, data necessary to estimate itemization are no longer available in the PSID. Given this reality we believe the TAXSIM estimates we produce are a reasonable alternative to the PSID values for 1980 to 1991 and can be used to estimate federal tax in a consistent way for subsequent years. Our estimated federal tax variables will be made available in 1998 to users of the PSID-GSOEP Equivalent File, 1980-

1995. In that dataset we also provide state income tax information and Social Security tax information for the PSID population and equivalent federal income tax and Social Security tax information for the GSOEP population.

Appendix

The PSID Tax Model

The tax simulation program developed by the PSID staff estimated federal income taxes for individuals in the PSID using a number of variables available in the PSID data. The PSID tax simulation program is divided into two parts. The first part of the program is written to compute tax burdens for the head and spouse of the family. The second part of the program computes tax burdens for other family members. This division is necessary because the PSID only interviews one member of each family, the head, and only asks detailed questions about the head and spouse. Although information is obtained from the head about other individuals in the family, this information is not very detailed and requires a different set of rules in order to estimate tax burdens of the whole family.

Filing Status

Taxes are calculated for single heads, married couples, and heads of family. The PSID considers a couple to be “married” if they are living together as man and wife and have been doing so for at least a year, regardless of their legal marital status. In the tax simulation program, every “married” couple files taxes jointly. Individuals are assigned a tax filing status of head of family if: they are unmarried, divorced, separated, widowed, or never married; they have one or more dependent children or other relatives living in the family; and they contribute more than half the expenses of the family.

In cases where the current head’s spouse moved out after the end of the tax year, the spouse died since the last interview, or where the head is female with a husband living in the family, the head is entitled to file a married tax return, but the spouse is treated as another family member in the interview. These are all cases where the individuals were in the family in the tax year/previous year. For tax purposes, the two incomes are added together and the tax is calculated using the married tax table. The tax is then divided proportionately to the incomes

and is coded in the variables for the head's tax and the wife's tax.

The PSID also separates out individuals who married during the survey (they were not married in the tax year previous year). The income for these individuals is coded jointly, but they are not eligible to file taxes jointly. The tax for these persons is coded as the sum of their individual amounts and the marginal tax rate applied is the larger of the two amounts.

Finally, the PSID separates out other family unit members who were present in the family unit for only part of the tax year (previous survey year). For these individuals, the PSID records their incomes for the time they were in the family unit. Marginal tax rates are assigned and tax payments calculated using the part-year incomes.

Head/Wife Tax Burdens

The first step in computing tax burdens for the head and wife is to create Adjusted Gross Income (AGI). In the PSID tax simulation program, a variable for AGI is initialized to be equal to the head and wife taxable income (PSID variable). If the spouse died or left the family before the current survey year, then the spouse's income is included under taxable income for the first extra earner. AGI is adjusted to include this income. Alimony paid by the head and wife (PSID variable) is subtracted from AGI. Next AGI is adjusted to include 75 percent of retirement income (PSID variable) exclusive of Social Security and VA pensions. This percentage changes yearly and is the ratio, over all income classes, of pension and annuity income in AGI to total pensions and annuity income. This information is supplied by the staff at the IRS's *Statistics of Income Bulletin*. Finally, any unemployment compensation received by the head and wife (PSID variable) is added to AGI. Next the taxable amount of Social Security benefits is added to AGI. This amount is calculated as the smaller of one-half of the net benefits received or one-half of the amount by which the sum of modified AGI plus one-half of the net benefits exceeds the base amount. AGI is now complete.

Prior to 1984, the PSID did not ask the head whether he itemized deductions. Instead,

they assumed that all homeowners with a mortgage itemized their deductions. Homeowners without a mortgage took the standard deduction if their taxable income was less than \$20,000 and itemized their deductions if their taxable income was greater than or equal to \$50,000. For those with income greater than \$20,000 and less than \$50,000, the PSID used a property tax rule. If the homeowner's property tax was less than 5 percent of his taxable income, the individual took the standard deduction. If the homeowner's property tax was 5 percent or more of his taxable income, the individual itemized his taxes. Finally, to determine the amount of itemized deductions, the PSID used published statistics from the *IRS Statistics of Income—Individual Tax Returns*, which the IRS reports the average fraction of income deducted by itemizers by income class. After 1984, the PSID asked the head whether he itemized deductions. For those who did not respond to the question, the likelihood of itemizing deductions and the amount of income itemized was estimated. The likelihood of itemizing deductions is calculated for renters, owners without mortgages, and owners with mortgages (PSID variables). For those who itemized their deduction, the value of the deduction is estimated. Nothing is done for those who did not itemize their deductions. The algorithm for itemization of deduction excludes those with asset income (PSID variable) of 0 or those with labor income (PSID variable) below the standard deduction level. The larger of the standard deduction or itemized income amount is subtracted from AGI.

Finally the program calculates the allowable deduction for exemptions (PSID variable). Taxes for head and wives are computed based on tax filing status (PSID variable), number of exemptions (PSID variable), and amount of taxable income. These taxes are then adjusted by elderly and low-income tax credits.

Extra Earner Tax Burdens

The tax simulation program calculates tax burdens for up to five extra earners in the family. The main variables necessary to compute tax burdens for these units are tax filing status, taxable income, and number of exemptions. The program also uses variables for the total taxable

income and total asset income of other family unit members. Because of the lack of information available on these individuals, it is assumed that all extra earners take the standard deduction allowable and that no extra earners are eligible to take tax credits. Also, AGI is assumed to be equal to the individual's taxable income. For individuals who were present in the family for only part of the year, their taxable income represents only that portion for the time they were present in the family. For other family unit members, AGI is not adjusted for such things as retirement income, unemployment compensation, and Social Security.

After assigning taxable income as the individual's AGI, the program calculates the allowable deduction for exemptions (PSID variable) and the taxable income. Next the program computes taxes for these individuals based on tax filing status (PSID variable), number of exemptions (PSID variable), and taxable income. For those individuals who were present in the family for only part of the year, their part-year incomes are used to estimate their tax payments.

The NBER TAXSIM Model

Four programs are used to create the input variables for the TAXSIM model. The first program is PSID-8092.SAS. Its purpose is to extract variables from the original PSID data and to create a longitudinal dataset that contains both individual and family level information for each year 1980 through 1992.

The second program is TXST-8092.SAS. The first purpose of this program is to identify all possible tax units within a family unit. A son and daughter-in-law with their own income who live with his parents would be considered their own tax unit. A family such as this would contain at least two tax units. The second function of this program is to assign one of three tax filing statuses to each individual in the family unit (single, married, or head of family). Married individuals file taxes as married. Single individuals without dependents file taxes as single, and single individuals with dependents file taxes as head of family. Certain individuals, mostly

young children, will have no tax filing status. The third function of this program is to name certain individuals as dependents and total the number of dependents in each tax unit. Finally this program assigns an elderly tax credit to those who are eligible.

The third program is PSID-HTAX.SAS. This program creates all of the input variables for the NBER TAXSIM Model. The last program used is PSID-OUT.SAS. This program outputs a dataset for each year containing the input variables on one record for each married pair in the family unit, one record for each single filer in the family unit, and one record for each head of family filer in the family unit.

Sample

The sample includes individuals in the PSID data between 1980 and 1992. The Latino oversample is excluded. All information, regardless of whether the individual was in the survey at the time of the interview, is used.

More on TXST-8092.SAS

This program first assigns individuals to tax units within the family. Initially tax units are assigned using the variable marital pairs indicator. The variable marital pairs indicator has a value greater than 1 for individuals in the family who are married or cohabiting. Each individual of the pair has the same value for marital pairs indicator. The first pair in the family is assigned a value of 1, the second pair in the family is assigned a value of 2, and so on. Individuals who are not married and not cohabiting have a value of 0 for their marital pairs indicator. Next, the value of tax unit is recoded from 0 for all unmarried heads. Unmarried heads who have a sequence number variable between 1 and 20 are assigned a tax unit of 9. All other unmarried heads are assigned a tax unit of 99. Finally, because cohabiting couples cannot file taxes as married couples, each partner in the cohabiting couple is treated as a separate tax unit. The value of the tax unit is recoded to 999 for all unmarried partners. These individuals all have a relationship to head variable equal to 22,

The next step in the program is to define dependents. We use the PSID's rule for this. Different rules are applied to individuals who stayed in the family unit the entire previous survey year (nonmovers) and those who were in the family unit for part of the previous survey year (movers). The PSID rules for identifying dependents are:

Non-Movers:

Must all meet the income test. The income test is that age is less than 16 and annual income is less than \$10,000, or age is 16 and older and annual income is less than \$5,000.

Movers:

Anyone with relationship to head code of 83, 88, or 95-98 (i.e., not a relative) must have been in the family unit all of the previous year and must meet the income test to be a dependent of the head.

Any child born (or adopted) into the family unit at any time during the previous year is a dependent if he or she meets the income test.

Any relative who dies at any time during the previous year is a dependent if he or she meets the income test.

Any other relative who moves in or out must have been in the family unit at least six months and meet the income test in order to be a dependent.

Next the program assigns each nondependent unmarried person into a tax unit. Finally, each dependent is assigned to the appropriate tax unit using information on the individual's relationship to head variable. Sons and daughters of the head are assigned to the tax unit of the head. Grandchildren of the head are assigned to the tax unit of the head's children (assuming that they are also living in the family). Brothers and sisters of the head are assigned to the tax unit of the head's parents (again, assuming that the parents are also living in the family). All individuals who can not be assigned to a tax unit are assigned the tax unit of the head.

The next part of the program counts up the number of individuals within each tax unit in the family to obtain the total number of allowable exemptions. The final part of the program creates variables for tax filing status and number of dependent deductions allowed. To assign tax

filing status, we first look at the group of individuals who are under the age of 16 and have no earnings or assets. If these individuals are unmarried (there are a number of girls age 15 who are married) they do not file their own taxes and their tax filing status and number of dependent deductions are set to missing. If they are married then their tax filing status is married and their number of dependent deductions is equal to the number of allowable exemptions minus 2. Next we look at the group of individuals who are under the age of 16 and have nonzero earnings or assets. If these individuals are unmarried and the tax year is between 1980 and 1987 they are assigned a tax filing status of single and their number of dependent deductions is set to 0. If these individuals are unmarried and the tax year is 1988 or later they are assigned a tax filing status of single and their number of dependent deductions is set to -1. Those individuals who are married are assigned a tax filing status of married and their number of dependent deductions is equal to the number of allowable exemptions minus 2. Finally we look at the group of individuals who are age 16 and older. If these individuals are married then their tax filing status is married and their number of dependent deductions is equal to the number of allowable exemptions minus 2. Those who are not married and have dependents are assigned a tax filing status of head of family and their number of dependent deductions is equal to the number of allowable exemptions minus 1. Those who are not married and have no dependents are assigned a tax filing status of single and the number of dependent deductions are equal to the number of allowable exemptions minus 1. Finally, those who are not married and are dependents themselves are assigned a tax filing status of single and their number of dependent deductions is set to 0 or -1, depending on the tax year.

The last part of the program assigns an elderly tax credit to all heads or partners in the family unit aged 65 or older. The tax credit is not assigned to other family unit members and there can be no more than two individuals in the tax unit eligible for the tax credit.

More on PSID-HTAX.SAS

The next program creates the input variables for NBER TAXSIM Model. Most of the nonincome variables are straightforward (i.e., case id, state, tax year, tax filing status, etc.) The income variables were created using a number of different variables and a number of different assumptions. Income variables were created, where possible, for the head, wife (partner), and other family unit members. For heads, asset income is the sum of income from rent, head/wife asset income from farming, head/wife asset income from business, head/wife asset income from gardening, head/wife asset income from boarders, and alimony income received minus wife part of asset income. For wives, asset income is the sum of wife part of asset income and wife other asset income. For individuals other than the head and wife, asset income is assigned using information from the PSID individual file that describes their taxable income as asset income only.

For heads, labor income is equal to head/wife taxable income minus the sum of wife labor income, dividend income, head asset income, and wife asset income. For wives, labor income is taken directly from the PSID data. For individuals other than the head and wife, labor income is assigned using information from the PSID individual file that describes their labor income as labor income only or the combination of labor and asset income.

Finally, non Social Security income is the sum of AFDC income, SSI income, worker's compensation, other welfare income, and VA pensions. This variable is created for the head and the wife.

There are a number of family level variables that are only asked of the head. These variables include dividend income, rental income, property taxes, and child care expenses and are assigned only to the head of the family to avoid double counting. Since the PSID provides detailed information on only the head and wife in each family unit, a number of input variables have positive values for only the head and wife. Those individuals who are not the head or wife

will have zeros filled in for number of age exemptions, dividend income, rental income, property taxes, child care expenses, social security income, unemployment compensation, and other transfer income.

More on PSID-OUT.SAS

This program outputs a dataset for each year containing the input variables on one record for each married pair in the family unit, one record for each single filer in the family unit, and one record for each head of family filer in the family unit. First the program aggregates labor income, asset income, pension income, social security income, unemployment compensation, and transfers are for the partners in each married pair. Next the program subtracts alimony paid from asset income. Alimony paid is nonzero for heads and wives only. Finally the program assigns the appropriate variables to each individual according to tax filing status. The input variable for wage and salary of taxpayer is assigned the total head and wife labor income and the input variable for wage and salary of spouse is assigned zero. Because the PSID provides no information on the actual amount of itemized deductions, the input variable is set to zero for everyone. Finally, all negative income, other than asset income, is set to zero.

Endnotes

1. We discuss the definition of tax unit in more detail later in the paper. The PSID also estimates Social Security tax payments in the same manner.
2. Net-of-tax income is especially valuable for those interested in cross-national comparisons of economic well-being, since most European countries have much higher tax burdens than does the United States. See Duncan et al. (1995) and Burkhauser et al. (1996), for example.
3. Prior to 1993 these variables were provided in the PSID so that users could estimate their own measure of family tax burdens if they disagreed with the assumptions made to generate tax burdens available in the data.
4. The Current Population Survey (CPS) defines a household sharing unit as all members of the dwelling unit. A CPS family sharing unit consists of all blood relatives or married persons in the household. The PSID definition of a family sharing unit falls between the two definitions of sharing units in the CPS. In the PSID a family consists of all blood and adopted relatives, legally married persons and cohabiters, where cohabiters are two adult persons who have lived together in the same family for at least one year.
5. The assumption that individuals, in fact, equally share resources within a sharing unit is the subject of debate. See Jenkins (1991).
6. The NBER TAXSIM model is also capable of measuring state tax burdens.
7. It is possible for a dependent in one tax unit within the family to have their own source of income and, hence, their own tax filing unit. We follow PSID convention and define dependents as family members who are less than age 16 and have an annual income of less than \$10,000 or older than 16 and have an annual income of less than \$5,000.
8. This is a break from the PSID convention. In the PSID all cohabiters are assumed to file jointly.
9. If the nondependent son had a dependent he would be considered the head of a household that contains himself and his dependent.
10. We cannot separate cohabiting individuals from married individuals for family members other than the head and spouse.
11. Homeowners without a mortgage were assumed to take the standard deduction if their taxable income was less than \$20,000 and to itemize their deductions if their taxable income was greater than or equal to \$50,000. For those with income greater than \$20,000 and less than \$50,000, the PSID used a property tax rule. If a homeowner's property tax was less than 5 percent of taxable income, the individual was assumed to take the standard deduction. If a homeowner's property tax was 5 percent or more of taxable income, the individual was assumed to itemize.

12. The PSID never collected information about itemization for family members other than the head and partner.

Table 1. List of TAXSIM Input Variables and Corresponding Head/Wife PSID Variables

TAXSIM Input Variables	PSID Head/Wife Input Variables
Case ID	Household ID number
Tax Year	Income year (survey year minus 1)
State	State of residence in survey year
Tax Filing Status	Created (previously provided in the PSID)
Dependent Exemptions	Created (previously provided in the PSID)
Age Exemptions	Number of taxpayers over 65 years
Wage/Salary Income	Sum of head and wife labor income
Dividend Income	Head dividend income
Other Property Income	Sum of asset income, alimony received, and rental income. Minus alimony paid and interest/dividends.
Pensions	Sum of head and wife other retirement income
Social Security Income	Sum of head and wife Social Security income
Other Transfer Income	Sum of head and wife SSI, VA pensions, worker's compensation, AFDC, and other welfare income
Rent Paid	Head rent paid (set to zero in 1987 and 1988)
Property Taxes Paid	Head property taxes paid (set to zero in 1987 and 1988)
Itemized Deductions	Set to zero
Child Care Expenses	Head child care expenses
Unemployment Compensation	Sum of head and wife unemployment compensation

**Table 2. List of TAXSIM Input Variables and Corresponding PSID
Variables for Other Family Members**

TAXSIM Input Variables	PSID Other Family Member Input Variables
Case ID	Household ID number
Tax Year	Income year (survey year minus 1)
State	State of residence in survey year
Tax Filing Status	Created (previously provided in the PSID)
Dependent Exemptions	Created (previously provided in the PSID)
Age Exemptions	Set to zero
Wage/Salary Income	Individual labor income or sum of individual labor income for married couples
Dividend Income	Set to zero
Other Property income	Individual asset income or sum of individual asset income for married couples
Pensions	Set to zero
Social Security Income	Set to zero
Other Transfer Income	Set to zero
Rent Paid	Set to zero
Property Taxes Paid	Set to zero
Itemized Deductions	Set to zero
Child Care Expenses	Set to zero
Unemployment Compensation	Set to zero

Table 3. Number of Individuals in the PSID for Only Part Year

	1980	1981	1982	1983	1984	1985
Total Part Year Cases	392	303	324	438	342	399
Married between Surveys	86	37	47	54	41	40
Head or Wife - Part Year	96	101	97	124	96	190
Single - Part Year	205	155	171	247	192	152
Married - Part Year	4	10	8	11	9	9
Head - Part Year	1	0	1	2	4	8
Total Observations	12,592	12,653	12,771	12,938	12,987	13,178
Percentage of Part Year Cases	3.1	2.4	2.5	3.4	2.6	3.0
	1986	1987	1988	1989	1990	1991
Total Part Year Cases	276	303	322	315	364	292
Married between Surveys	24	24	41	33	55	38
Head or Wife - Part Year	89	108	124	112	152	143
Single - Part Year	146	154	142	159	139	95
Married - Part Year	10	11	14	10	17	8
Head - Part Year	7	6	1	1	1	8
Total Observations	13,180	13,208	13,294	13,356	13,702	13,691
Percentage of Part Year Cases	2.1	2.3	2.4	2.4	2.7	2.1

Table 4. Number of Cohabiting Individuals and Married Individuals in the PSID

Year	Heads and Partners			Other Members
	Total Married or Cohabiting	Total Cohabiting	Percent Cohabiting	Total Married or Cohabiting
1980	7,701	201	2.61	62
1981	7,640	220	2.88	86
1982	7,692	268	3.48	90
1983	7,892	340	4.31	102
1984	7,970	374	4.69	94
1985	7,996	324	4.05	120
1986	8,024	380	4.74	106
1987	8,064	396	4.91	82
1988	8,106	466	5.75	70
1989	8,129	462	5.68	87
1990	8,223	490	5.96	77
1991	8,231	546	6.63	78

Table 5. Comparison of Tax Filing Status Variables in TAXSIM and PSID

TAXSIM	PSID	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Single	Single	26.0	26.9	26.2	25.4	25.2	25.7	25.9	26.0	26.2	26.5	27.5	27.6
	Married	1.8	1.6	2.2	2.1	2.3	2.0	2.4	2.4	2.7	2.7	2.9	3.1
	Head	0.5	0.7	0.6	0.5	0.7	0.6	0.7	0.7	0.6	0.6	0.5	0.7
	Other	2.3	1.7	1.9	2.4	1.9	2.2	1.5	1.7	1.7	1.7	1.7	1.3
Married	Single	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	Married	58.9	58.5	58.1	58.2	58.5	58.3	58.0	58.1	57.4	57.3	56.1	56.1
	Head	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0
	Other	0.7	0.5	0.4	0.6	0.4	0.5	0.3	0.4	0.5	0.4	0.6	0.5
Head	Single	2.0	2.1	2.8	2.2	2.3	2.0	1.8	2.0	2.2	2.1	2.4	2.4
	Married	0.6	0.6	0.7	1.1	1.2	1.0	1.1	1.2	1.5	1.5	1.4	1.5
	Head	6.8	7.0	6.8	7.0	7.0	7.2	7.6	7.2	6.8	6.7	6.4	6.4
	Other	0.1	0.2	0.1	0.3	0.3	0.4	0.2	0.1	0.3	0.3	0.3	0.3
Total Matches		91.7	92.4	91.1	90.6	90.7	91.2	91.5	91.3	90.4	90.5	90.0	90.1
Missing		7,155	7,143	7,341	7,389	7,406	7,502	7,257	7,278	7,212	7,095	7,043	7,080
N Count		12,592	12,633	12,771	12,938	12,987	13,178	13,180	13,208	13,294	13,356	13,702	13,691

Table 6. Number of Individuals Living in Households by Whether the Head of the Household Itemized Taxes

Year	Number of Individuals				Percentage of Total		
	Standard Deviation	Itemize	Missing	Total	Standard Deviation	Itemize	Missing
1984	10,693	8,635	182	19,510	54.81	44.26	0.93
1985	10,467	9,089	161	19,717	53.09	46.10	0.82
1986	10,186	9,200	166	19,552	52.10	47.05	0.86
1987	10,029	9,416	133	19,578	51.23	48.09	0.68
1988	10,745	8,729	142	19,616	54.78	44.50	0.72
1989	11,341	8,149	109	19,599	57.87	41.58	0.56
1990	11,816	7,940	113	19,869	59.47	39.96	0.57
1991	11,990	7,743	145	19,878	60.32	38.95	0.73

**Table 7. Percentage of Individuals Who Itemize Deductions,
By Income Group**

Year	Standard Deduction	Itemize	Missing	Observations
Low Income				
1984	80.4	17.9	1.7	8,023
1985	77.4	21.7	0.9	8,013
1986	78.5	20.2	1.3	7,882
1987	78.4	20.9	0.7	7,911
1988	82.0	16.7	1.2	7,939
1989	82.7	16.4	0.9	7,464
1990	83.5	15.7	0.9	7,670
1991	84.1	15.3	0.6	7,536
Middle Income				
1984	43.3	56.0	0.7	6,647
1985	40.7	58.5	0.8	6,809
1986	40.2	59.1	0.6	6,703
1987	38.6	60.6	0.8	6,656
1988	45.1	54.4	0.5	6,670
1989	53.1	46.3	0.6	6,798
1990	55.0	44.4	0.6	6,774
1991	54.9	44.0	1.2	6,837
High Income				
1984	13.5	86.1	0.4	4,840
1985	13.2	85.9	0.9	4,895
1986	10.7	88.5	0.8	4,967
1987	10.9	88.5	0.6	5,011
1988	14.3	85.0	0.8	5,007
1989	17.8	81.5	0.7	5,337
1990	19.9	79.8	0.4	5,426
1991	20.4	78.8	0.8	5,506

Table 8. Variable Definitions and Descriptions

Variable	Description
Age	Age of Individual
Age ²	Age Squared
Head	Tax Filing Status is Head of Household
Married	Tax Filing Status is Married
Income	Pre-Tax Family Income
High School	High School Education
College	More than High School Education
Full-Time	Full-Time Employed
Part-Time	Part-Time Employed
Own House	Head Owns Dwelling
Cohabit	Nonmarried Cohabiter
Gender	Female
Deductions	Number of Dependent Exemptions
Race	Black
Oversample	Individual is in the Oversample Population
North	State of Residence is in North East
South	State of Residence is in South
West	State of Residence is in West
Itemize	Head Itemized Tax Deductions

Table 9. Regression Results of the Difference between TAXSIM and PSID Tax Estimates
Dependent Variable: (TAXSIM-PSID)/(Pre-Government Family Income/100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Constant	-1.891**	-1.604**	-0.379	0.225	-8.159	1.208	-1.720**	-0.047	-2.376**	-0.654	-0.147	1.273
Age	0.074**	0.065**	0.050*	-0.012	1.921	0.006	0.029	-0.010	-0.016	-0.066	0.019	-0.033
Age Squared	-0.001**	-0.001**	-0.001*	0.000	-0.017	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Married	0.211	0.209	0.237	-0.970**	17.147*	0.845*	0.518	0.696**	0.284	0.187	-0.105	-0.020
Head of Household	-1.400**	-2.064**	-1.431**	0.710	-18.090	-0.980	-2.130**	-0.253	2.450**	1.759	0.579*	4.039**
High School	0.596**	0.884**	0.463**	0.693**	11.624	-0.083	0.097	-0.062	0.007	0.574	0.204	0.358
College	1.317**	1.753**	1.061**	1.588**	5.226	1.021*	0.582*	0.730**	0.688**	0.986	0.484**	1.364**
Full-Time	-0.123	-0.481**	-0.318	0.153	-12.229	-0.508	0.589**	0.450**	-0.053	1.061	0.117	-1.496**
Part-Time	-0.207	-0.748**	-0.103	0.427	-12.136	-0.260	-0.348	0.290**	-0.062	0.882	0.133	-1.365**
Own Home	1.462**	2.023**	2.034**	2.446**	-13.642	-1.042**	0.286	0.186*	0.203	0.413	-0.211	0.322
Unmarried Cohabiter	0.432	-0.423	-0.525	0.210	-9.429	0.513	0.132	0.264	-0.249	0.669	0.481	0.668
Gender	-0.028	0.028	-0.044	-0.171	3.010	0.263	0.126	0.280**	0.301	0.503	-0.161	0.024
Deductions	-0.195**	-0.238**	-0.069	-0.087	0.682	0.041	0.069	-0.055	-0.296	-0.138	-0.253**	-0.177
Race	-0.676**	-0.435*	-0.153	-0.666	-5.835	-0.336	0.487	-0.405**	0.217	-0.053	0.080	-0.541
Oversample	-0.248	-0.301*	-0.712**	-0.321	-2.124	-0.615	-0.354	-0.176	-0.302	-0.546	0.237	-0.418
North	-0.029	0.282	-0.285	-0.675*	-13.718	-1.018*	0.787**	-0.429**	0.304	0.032	-0.080	-0.373
South	0.264*	0.456**	0.044	-0.320	-9.645	-0.197	0.980**	0.110	0.341	0.306	-0.224	0.750
West	0.487	0.691**	0.188	-0.490	-12.429	-0.994*	1.203**	0.243*	0.338	0.371	-0.247	-0.114
Itemize					1.055	3.790**	2.926**	3.121**	4.415**	1.962**	2.052**	2.223**
R2	0.0537	0.0804	0.0356	0.0233	0.0003	0.0218	0.0453	0.2260	0.0820	0.0022	0.0316	0.0102

*Significant at the 5 percent level.

**Significant at the 1 percent level.

**Table 10. Regression Results of the Difference between TAXSIM and PSID Tax Estimates
for Individuals Living in Households Where the Head Did Not Itemize
Dependent Variable: (TAXSIM-PSID)/(Pre-Government Family Income/100)**

	1984	1985	1986	1987	1988	1989	1990	1991
Constant	-20.128	0.969	-0.691	0.774**	-1.437	0.287	0.098	0.914**
Age	3.751*	-0.067	-0.001	-0.029*	-0.028	-0.129	0.009	-0.064**
Age Squared	-0.035	0.001	0.000	0.000	0.000	0.001	0.000	0.001**
Married	-28.330	0.285	0.413	0.556**	0.566	0.422	-0.017	0.700**
Head of Household	-26.647	-0.073	-1.579**	0.179	4.224**	2.593	1.207**	2.602**
High School	23.068	0.120	0.060	0.119	-0.080	0.609	0.107	0.118
College	2.777	0.029	-0.290	-0.005	-0.002	0.489	0.154	0.273*
Full-Time	-26.439	0.211	-0.045	-0.270*	-1.088*	1.091	0.040	-0.269*
Part-Time	-23.104	1.024*	-0.230	0.307*	-0.252	1.238	0.343	0.188
Own Home	-26.620*	-0.229	0.356	-0.183	0.104	0.697	-0.331	0.033
Unmarried Cohabiter	-10.279	0.683	0.588	0.753*	-0.077	1.505	0.621	1.445**
Gender	6.458	0.161	-0.319	0.090	0.144	0.702	-0.181	-0.023
Deductions	0.397	0.222	0.311*	0.135**	-0.479**	-0.037	-0.335**	-0.313**
Race	-7.885	-0.314	0.526	-0.533*	0.214	0.017	0.104	0.442**
Oversample	-4.972	-0.356	0.059	0.228**	-0.156	-0.842	0.399	-0.114
North	-33.579*	-0.632	0.585	-0.795*	0.167	-0.172	0.044	-0.332**
South	-21.879	0.208	0.752*	-0.244**	0.198	0.038	-0.378	-0.090
West	-30.229	-0.409	0.776	-0.095	0.286	0.167	-0.291	-0.184
R2	0.0011	-0.0006	0.0057	0.0274	0.0127	-0.0017	0.0034	0.0705

*Significant at the 5 percent level.

**Significant at the 1 percent level.

**Table 11. Regression Results of the Difference between TAXSIM and PSID Tax Estimates
for Individuals Living in Households Where the Head Itemized
Dependent Variable: (TAXSIM-PSID)/(Pre-Government Family Income/100)**

	1984	1985	1986	1987	1988	1989	1990	1991
Constant	2.667*	5.299**	0.209	2.085**	0.714	0.068	1.234*	3.761
Age	-0.003	0.099	0.060	0.020	0.016	0.054*	0.039	0.024
Age Squared	0.000	-0.001	-0.001	0.000*	0.000	-0.001*	0.000	-0.001
Married	1.213*	1.155	0.277	0.730**	-0.349	-0.547*	-0.323*	-0.555
Head of Household	-1.332	-3.027*	-3.950**	-1.461**	-1.326**	-0.731	-1.066**	8.279**
High School	0.630	0.010	0.445	0.020	0.434	0.633**	0.471**	0.924
College	1.998**	1.721*	1.353	1.251**	1.420**	1.426**	0.899**	2.606*
Full-Time	-0.108	-1.111	1.161*	0.932**	0.937**	0.971**	0.211	-3.079*
Part-Time	-1.163*	-1.154	-0.344	0.349*	0.263	0.495*	-0.042	-3.365**
Own Home	-0.131	-2.223**	0.148	0.435**	0.170	-0.251	0.073	0.242
Unmarried Cohabiter	-0.215	0.446	-0.610	-0.107	-0.841	-1.666*	0.062	-1.737
Gender	0.373	0.311	0.572	0.426**	0.542**	0.288*	-0.137	0.143
Deductions	-0.435**	-0.184	-0.146	-0.268**	-0.251**	-0.291**	-0.234**	-0.104
Race	-0.457	-0.628	0.082	-0.481*	-0.119	-0.262	-0.164	-2.220
Oversample	0.491	-0.918	-0.873*	-0.611**	-0.509*	-0.115	0.008	-0.828
North	0.380	-1.375*	0.934*	-0.257	0.413*	0.233	-0.204	-0.454
South	1.083*	-0.616	1.159**	0.325*	0.524**	0.577**	-0.016	1.658
West	0.489	-1.310*	1.519**	0.459**	0.456*	0.626**	-0.206	-0.047
R2	0.0113	0.0093	0.0193	0.1044	0.0311	0.0378	0.0207	0.0076

*Significant at the 5 percent level.

**Significant at the 1 percent level.

Table 12. Regression Results of the Difference between TAXSIM and PSID Tax Estimates
Dependent Variable: (TAXSIM-PSID)/((TAXSIM+PSID)/2)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Constant	0.676**	0.811	0.197	-0.202	-0.022	0.085	0.007	-0.375*	-0.518	0.033	0.083	0.380*
Age	-0.010*	-0.031	-0.007	-0.011	-0.003	-0.007	-0.007*	-0.004	0.002	0.008	0.005	-0.026**
Age Squared	0.000**	0.000	0.000*	0.000*	0.000*	0.000*	0.000**	0.000	0.000	0.000	0.000	0.000**
Married	0.127**	-0.080	0.035	0.131	0.027	0.008	0.021	0.053	0.034	-0.094	-0.039	0.056
Head of Household	-0.423**	-0.244	-0.731**	-0.325**	-0.532**	-0.548**	-0.499**	-0.621**	-0.626*	-0.202	-0.666**	-0.062
High School	-0.056*	-0.261	0.059	0.087	0.075*	0.085*	0.025	0.171**	0.119	0.024	0.033	0.253**
College	-0.019	-0.262	0.068	0.185	0.058	0.102**	0.061**	0.195**	0.026	0.086	0.003	0.226**
Full-Time	-0.265**	-0.133	-0.133*	-0.030	-0.047	-0.041	0.022	-0.018	0.080	-0.145	-0.136	-0.129
Part-Time	-0.202**	0.008	-0.136**	-0.071	-0.155**	-0.021	-0.075**	-0.184**	-0.192	-0.182	-0.212**	-0.197*
Income	-0.008**	-0.003	-0.002	0.002*	0.001*	-0.002**	-0.002**	0.001	0.000	-0.003*	-0.001	-0.002
Income Squared	0.000**	0.000	0.000	0.000	0.000	0.000**	0.000**	0.000	0.000	0.000*	0.000	0.000
Own Home	0.049	-0.034	0.191**	0.187**	0.015	-0.008	0.071**	-0.107	0.017	0.194*	0.002	0.061
Unmarried Cohabiter	0.214	-0.215	-0.005	0.023	0.268**	0.043	0.125*	0.136	0.144	0.034	0.277	-0.347*
Gender	-0.051*	0.071	-0.030	-0.012	0.005	-0.026	0.010	-0.058	0.052	-0.091	-0.019	0.007
Deductions	0.015	0.169	-0.008	-0.082**	-0.056**	-0.004	-0.013	-0.012	-0.011	-0.008	-0.028	0.002
Race	-0.084*	0.814	-0.068	-0.161	-0.094*	-0.156**	-0.189**	-0.045	0.152	-0.416**	-0.087	-0.200*
Oversample	-0.077*	0.018	-0.225**	0.031	-0.096**	-0.044	0.030	0.049	-0.075	0.121	0.025	-0.127
North	-0.036	0.020	-0.046	0.128	0.028	-0.031	0.010	0.136*	-0.014	-0.041	-0.076	0.083
South	0.018	0.499	0.039	0.235**	0.066*	0.080*	0.057**	0.234**	0.008	-0.007	-0.009	0.133*
West	0.080*	0.064	0.074	0.197**	0.059	-0.026	-0.003	0.160*	-0.056	0.010	-0.056	0.083
Itemize					0.211**	0.336**	0.355**	0.476**	0.734**	0.236**	0.255**	0.143*
R2	0.0464	-0.0006	0.0368	0.0177	0.0747	0.0510	0.1339	0.0338	0.0048	0.0048	0.0161	0.0123

*Significant at the 5 percent level.

**Significant at the 1 percent level.

**Table 13. Regression Results of the Difference between TAXSIM and PSID Tax Estimates
For Individuals Living In Households Where the Head Did Not Itemize
Dependent Variable: (TAXSIM-PSID)/((TAXSIM+PSID)/2)**

	1984	1985	1986	1987	1988	1989	1990	1991
Constant	-0.327*	-0.062	-0.384**	-1.306**	-0.770	0.144	0.067	0.311
Age	0.010	-0.007	-0.006	0.014	0.014	0.012	0.014	-0.025
Age Squared	0.000	0.000	0.000*	0.000	0.000	0.000	0.000	0.000*
Married	0.046	0.023	0.034	0.146	-0.084	-0.031	0.006	0.071
Head of Household	-0.516**	-0.546**	-0.572**	-0.713**	-0.585*	-0.341	-0.968**	-0.176
High School	0.057	0.199**	0.053	0.281*	-0.011	0.034	0.064	0.321**
College	0.013	0.166*	0.127**	0.355*	-0.056	0.173	0.006	0.294*
Full-Time	-0.085	-0.045	0.068	-0.096	0.049	-0.121	-0.272*	-0.290*
Part-Time	-0.284**	0.010	-0.048	-0.455**	-0.235	-0.228	-0.360**	-0.302*
Income	0.003	-0.001	0.013**	0.024**	0.020**	-0.011	0.001	0.002
Income Squared	0.000	0.000	0.000**	0.000**	0.000*	0.000	0.000	0.000
Own Home	-0.005	-0.007	0.045	-0.370**	-0.066	0.346**	-0.098	-0.018
Unmarried Cohabiter	0.477**	-0.080	0.187	0.254	0.033	0.155	0.357	-0.463*
Gender	-0.015	-0.050	0.008	-0.196	0.175	-0.069	-0.066	-0.040
Deductions	-0.117**	-0.027	-0.025	-0.037	-0.003	-0.036	-0.030	0.048
Race	-0.079	-0.226**	-0.248**	-0.003	-0.137	-0.487**	-0.035	-0.211
Oversample	-0.101	-0.021	0.131**	0.131	-0.220	0.038	0.006	-0.151
North	0.129*	0.023	0.079	0.460**	-0.135	-0.087	-0.120	-0.034
South	0.188**	0.137*	0.089*	0.590**	-0.148	-0.140	-0.047	0.191
West	0.150*	-0.003	0.030	0.446**	-0.346	-0.058	-0.090	0.082
R2	0.0821	0.0267	0.1038	0.0302	0.0060	0.0060	0.0161	0.0147

*Significant at the 5 percent level.

**Significant at the 1 percent level.

**Table 14. Regression Results of the Difference between TAXSIM and PSID Tax Estimates
for Individuals Living in Households Where the Head Itemized
Dependent Variable: (TAXSIM-PSID)/((TAXSIM+PSID)/2)**

	1984	1985	1986	1987	1988	1989	1990	1991
Constant	0.421**	0.551**	0.579**	0.451**	0.464	0.457	0.245*	0.515*
Age	-0.012**	-0.006	-0.007*	-0.011**	-0.020	0.002	-0.002	-0.020
Age Squared	0.000**	0.000*	0.000**	0.000**	0.000	0.000	0.000	0.000*
Married	0.066	0.010	0.023	0.028	0.074	-0.093	-0.075	0.012
Head of Household	-0.334**	-0.478**	-0.230**	-0.155**	-0.639	0.166	0.078	0.192
High School	0.100**	-0.028	-0.034	0.037*	0.231	0.000	-0.007	0.133
College	0.095**	0.023	-0.007	0.064**	0.104	-0.002	-0.031	0.112
Full-Time	-0.020	-0.040	-0.036	0.015	-0.024	-0.146	0.003	0.040
Part-Time	-0.046	-0.037	-0.081**	-0.013	-0.195	-0.118	-0.057	-0.064
Income	0.001	-0.002**	-0.002**	-0.001**	-0.002	-0.002	-0.001**	-0.004**
Income Squared	0.000	0.000**	0.000**	0.000**	0.000	0.000	0.000*	0.000**
Own Home	-0.038	-0.042	0.017	0.014	0.007	-0.079	0.099*	0.069
Unmarried Cohabiter	-0.096	0.192	0.014	-0.087	0.089	-0.158	0.110	-0.020
Gender	0.011	-0.010	0.006	0.017	-0.063	-0.106	0.041	0.058
Deductions	-0.025*	0.013	0.001	0.003	0.012	0.025	-0.014	-0.036
Race	-0.076	-0.039	-0.079**	-0.030	0.768	-0.206	-0.100	-0.124
Oversample	-0.090**	-0.055	-0.042*	-0.033	0.088	0.222	0.045	-0.083
North	-0.053	-0.067*	-0.049*	-0.064**	0.093	0.026	-0.036	0.173**
South	-0.012	0.040	0.029	0.015	0.174	0.119	0.017	0.086
West	0.011	-0.042	-0.026	0.003	0.157	0.088	-0.027	0.082
R2	0.0310	0.0471	0.0484	0.05169	-0.0024	-0.0009	0.0155	0.0071

*Significant at the 5 percent level.

**Significant at the 1 percent level.

Figure 2a
Comparison of Mean Tax Burdens Using the PSID and TAXSIM
(Weighted Sample)

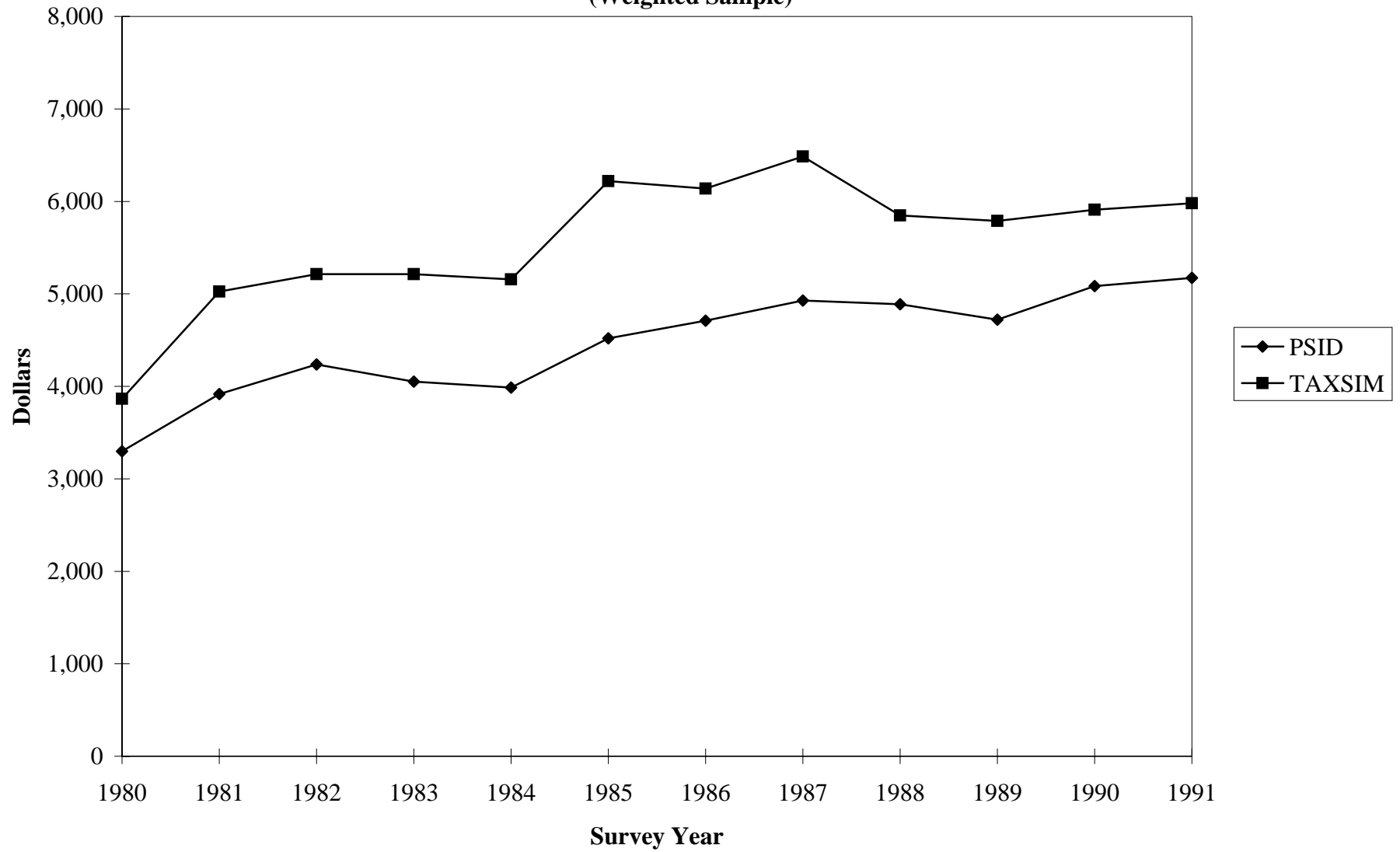


Figure 2b
Comparison of Median Tax Burdens Using the PSID and TAXSIM (Weighted Sample)

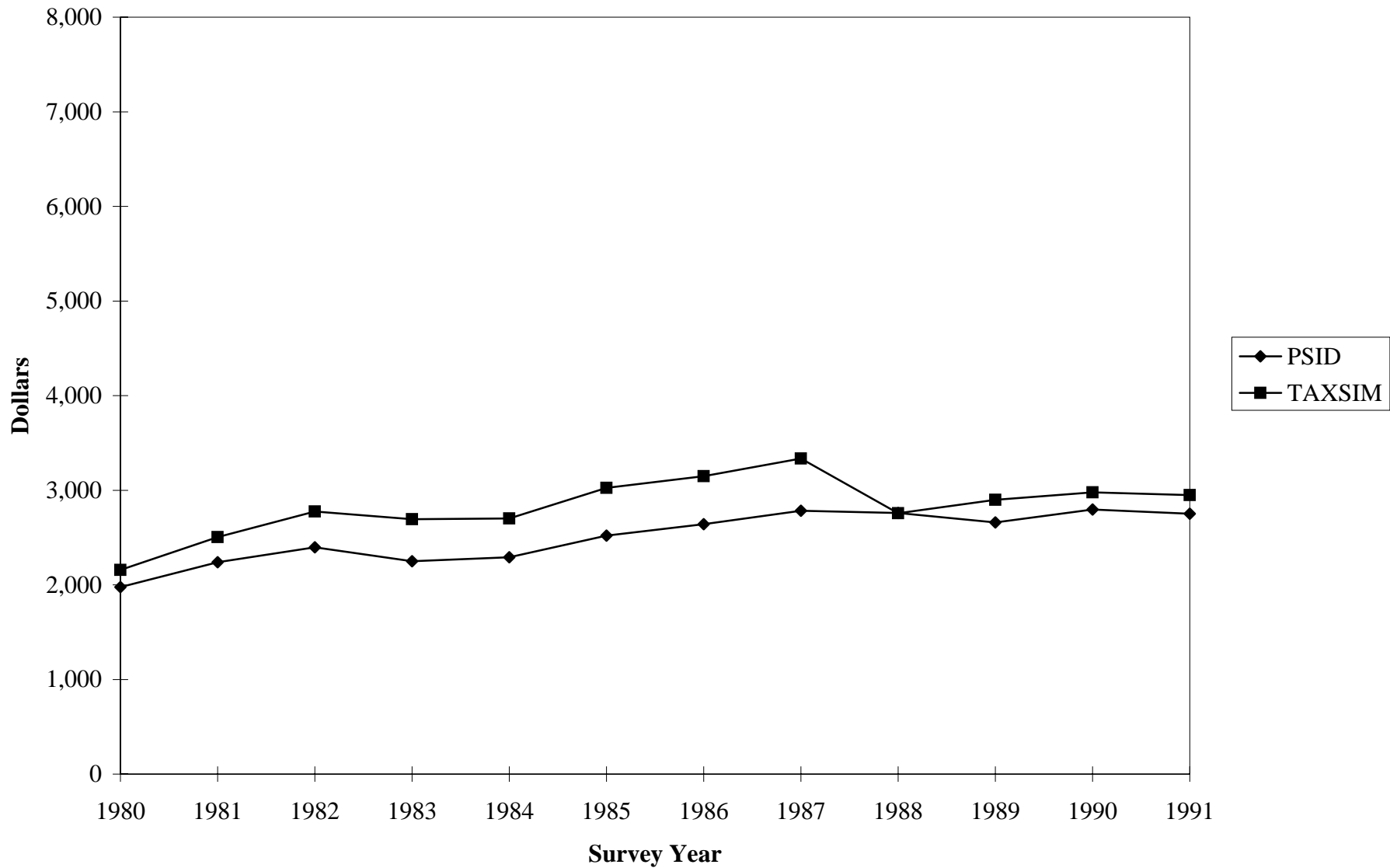


Figure 3a
Mean Individual-Level Family Tax Burdens Using the PSID (P) and the
TAXSIM (T) for Non-Married Cohabitors
(Weighted Sample)

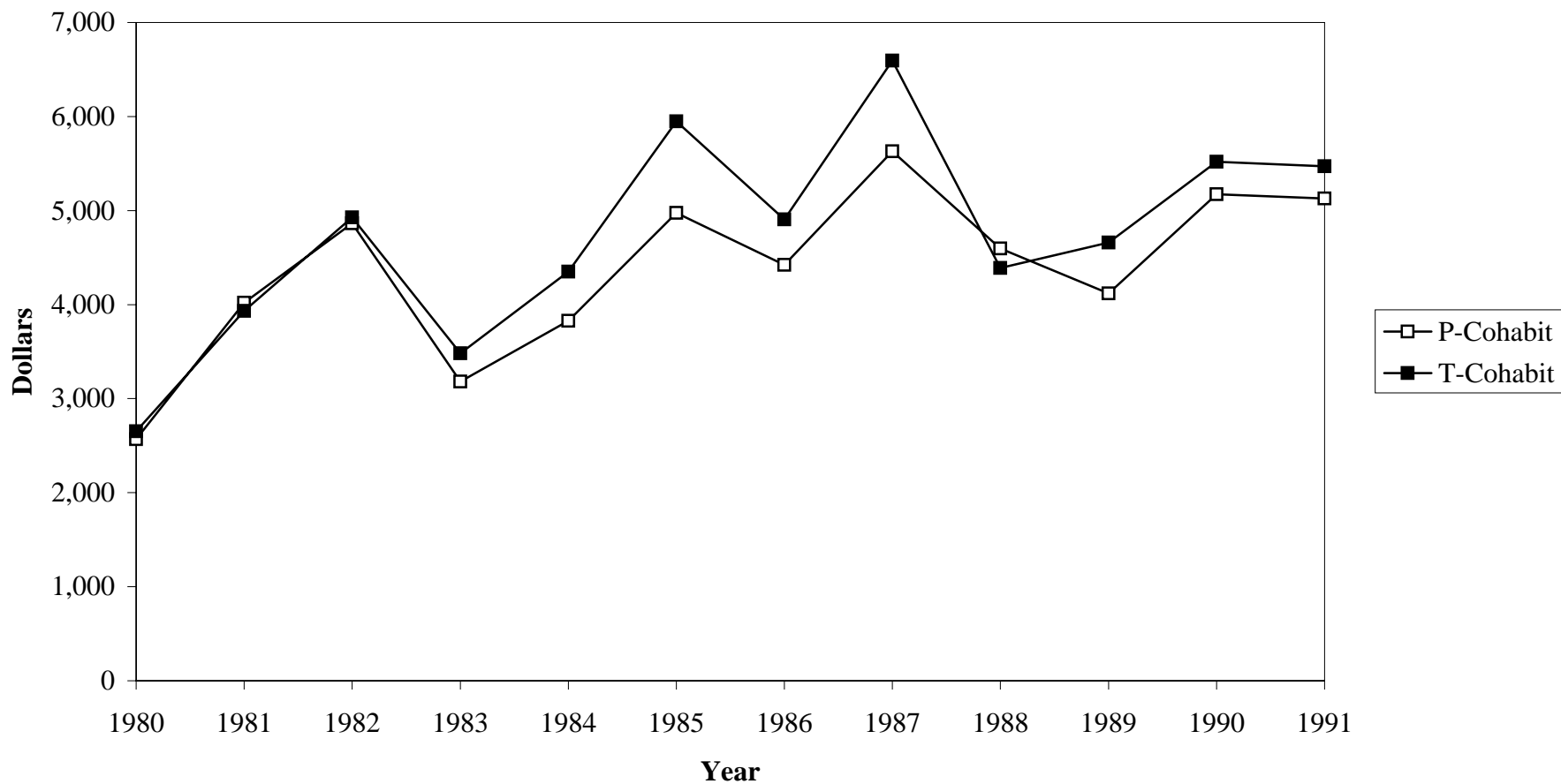


Figure 3b
Median Individual-Level Family Tax Burdens Using the PSID (P) and the
TAXSIM (T) for Non-Married Cohabitors
(Weighted Sample)

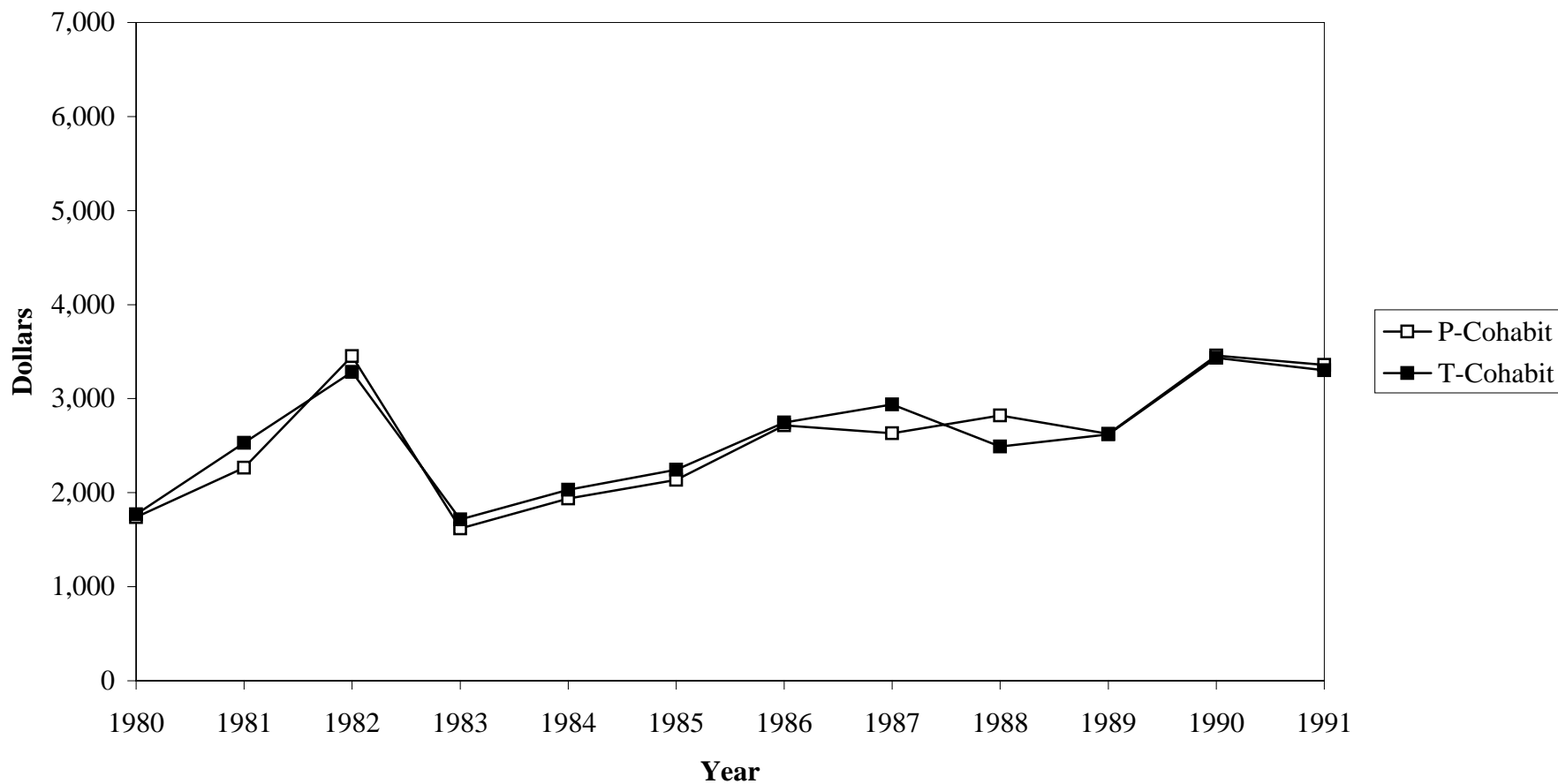


Figure 4a
Comparison of Mean Tax Burdens Using the PSID (P) and TAXSIM (T) by Tax Filing Status
(Weighted Sample)

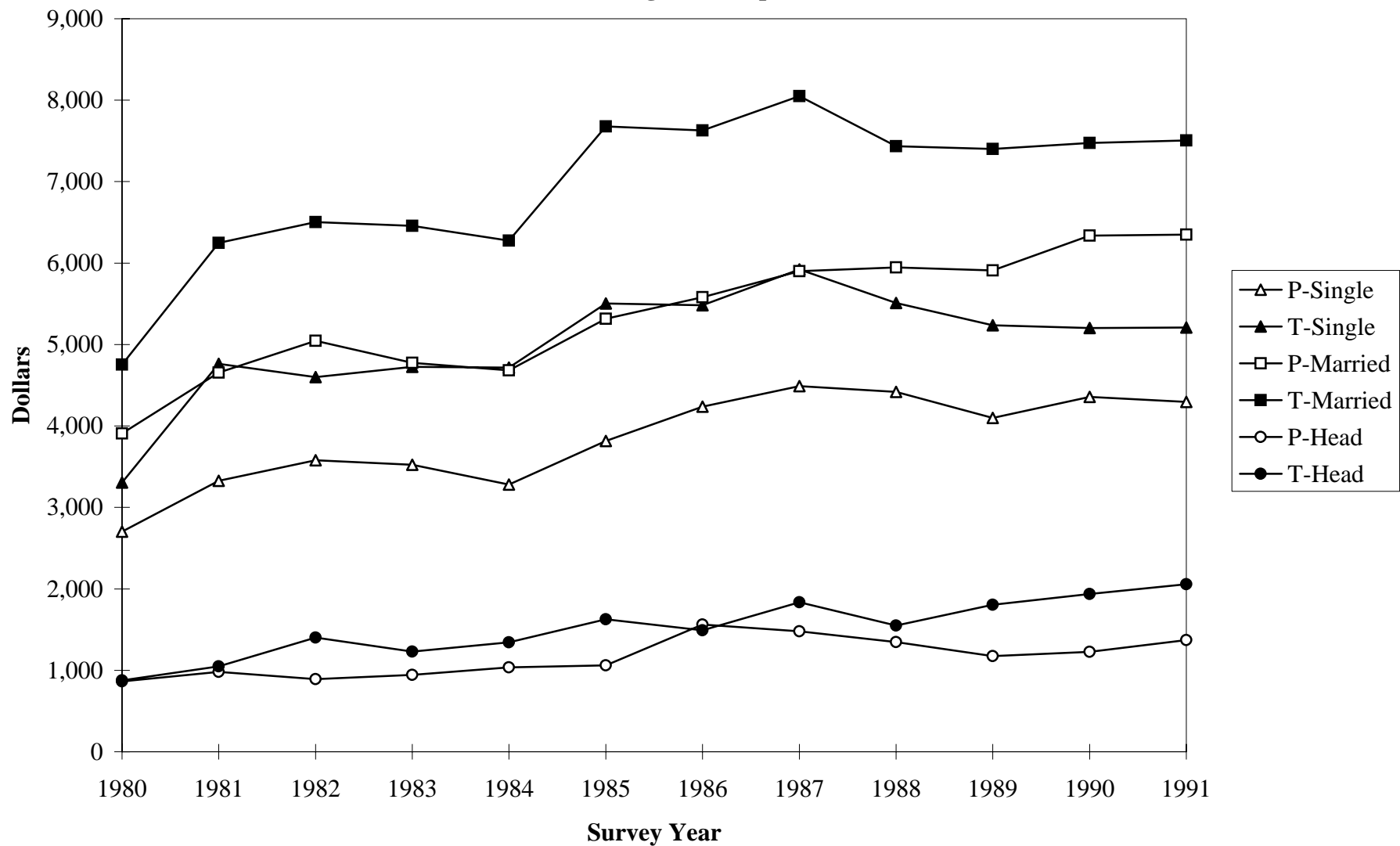


Figure 4b
Comparison of Median Tax Burdens Using the PSID (P) and TAXSIM (T) by Tax Filing Status
(Weighted Sample)

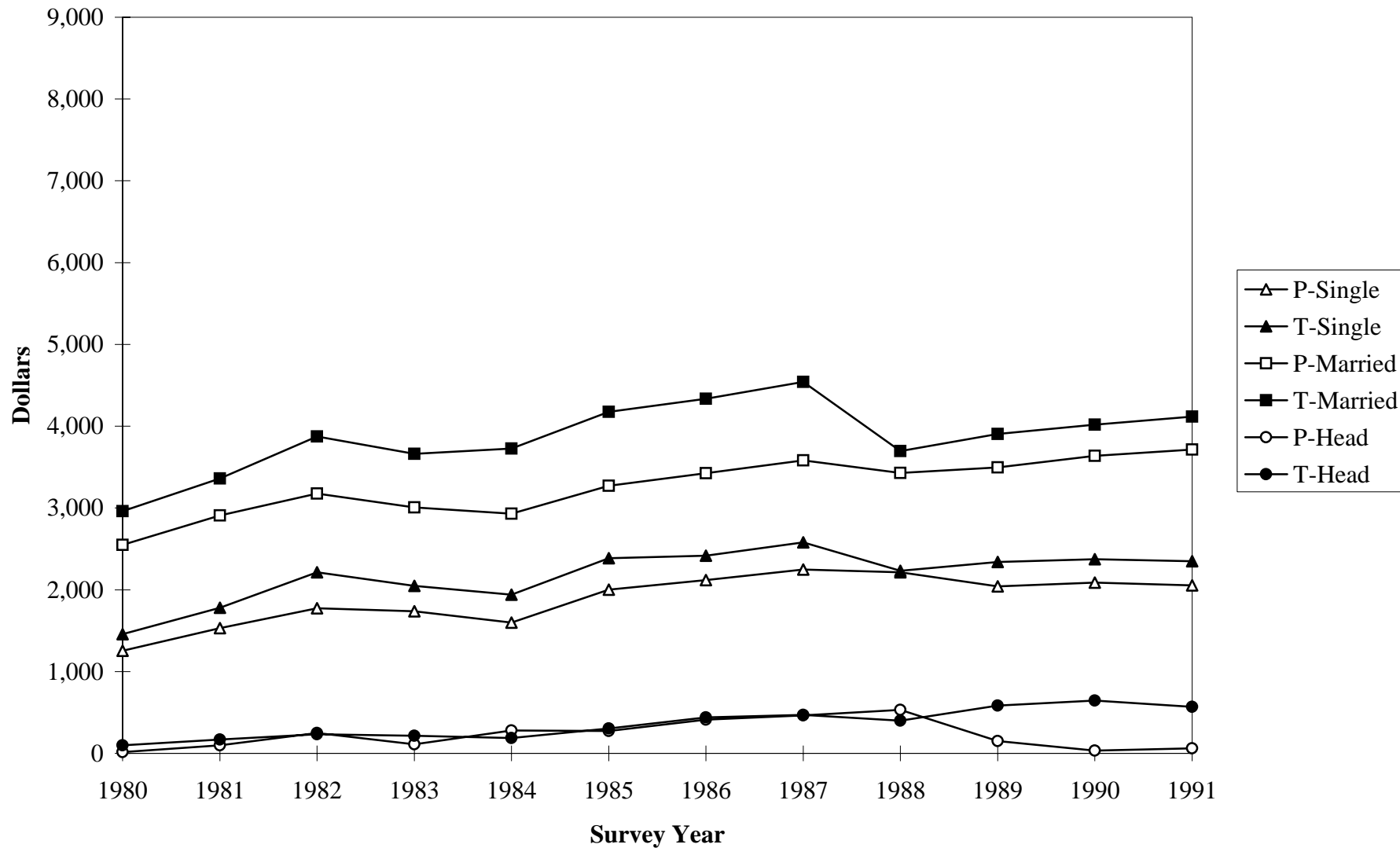


Figure 5a
Comparison of Mean Tax Burdens Using the PSID (P) and TAXSIM (T) by Itemization
(Weighted Sample)

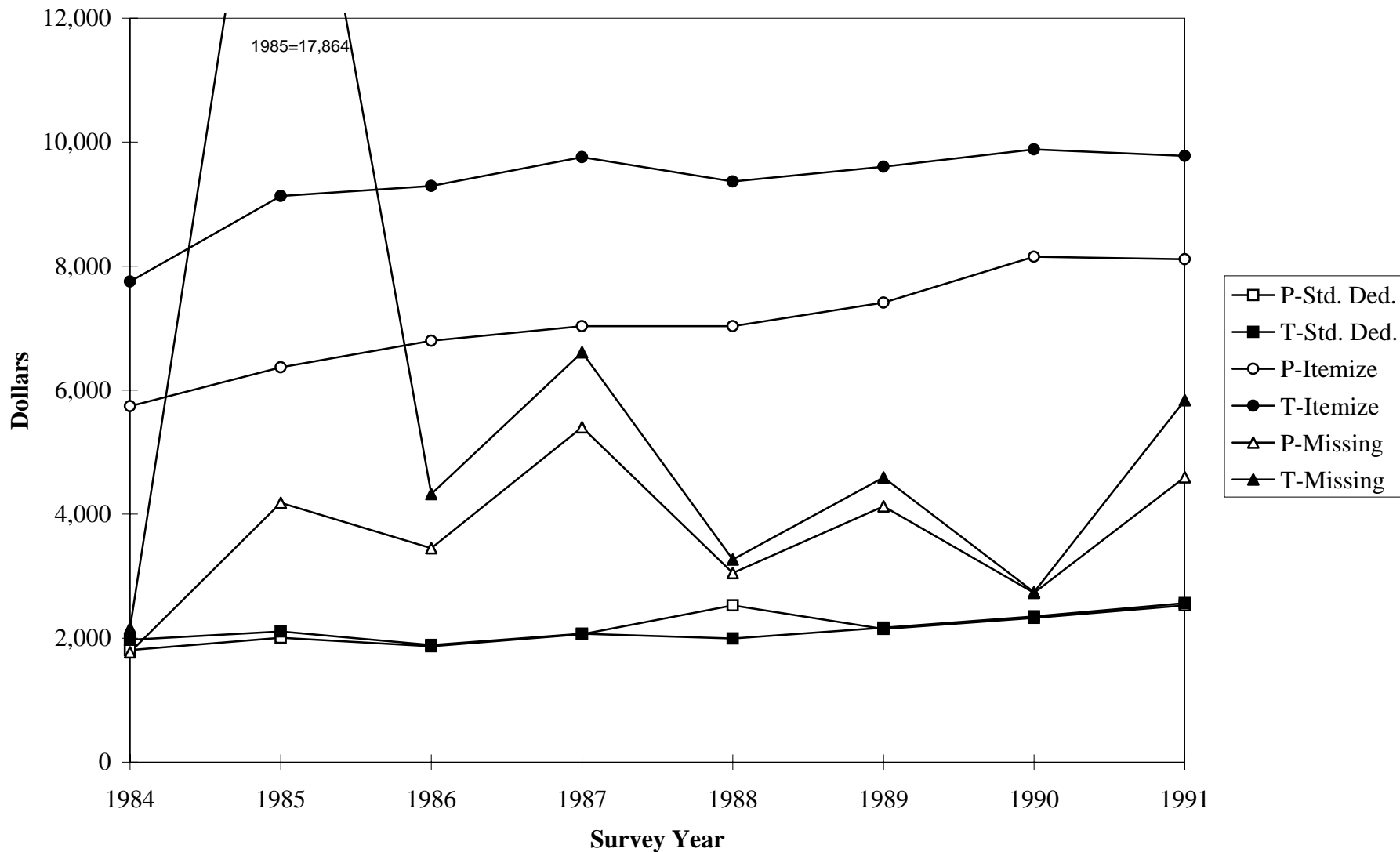


Figure 5b
Comparison of Median Tax Burdens Using the PSID (P) and TAXSIM (T) by Itemization
(Weighted Sample)

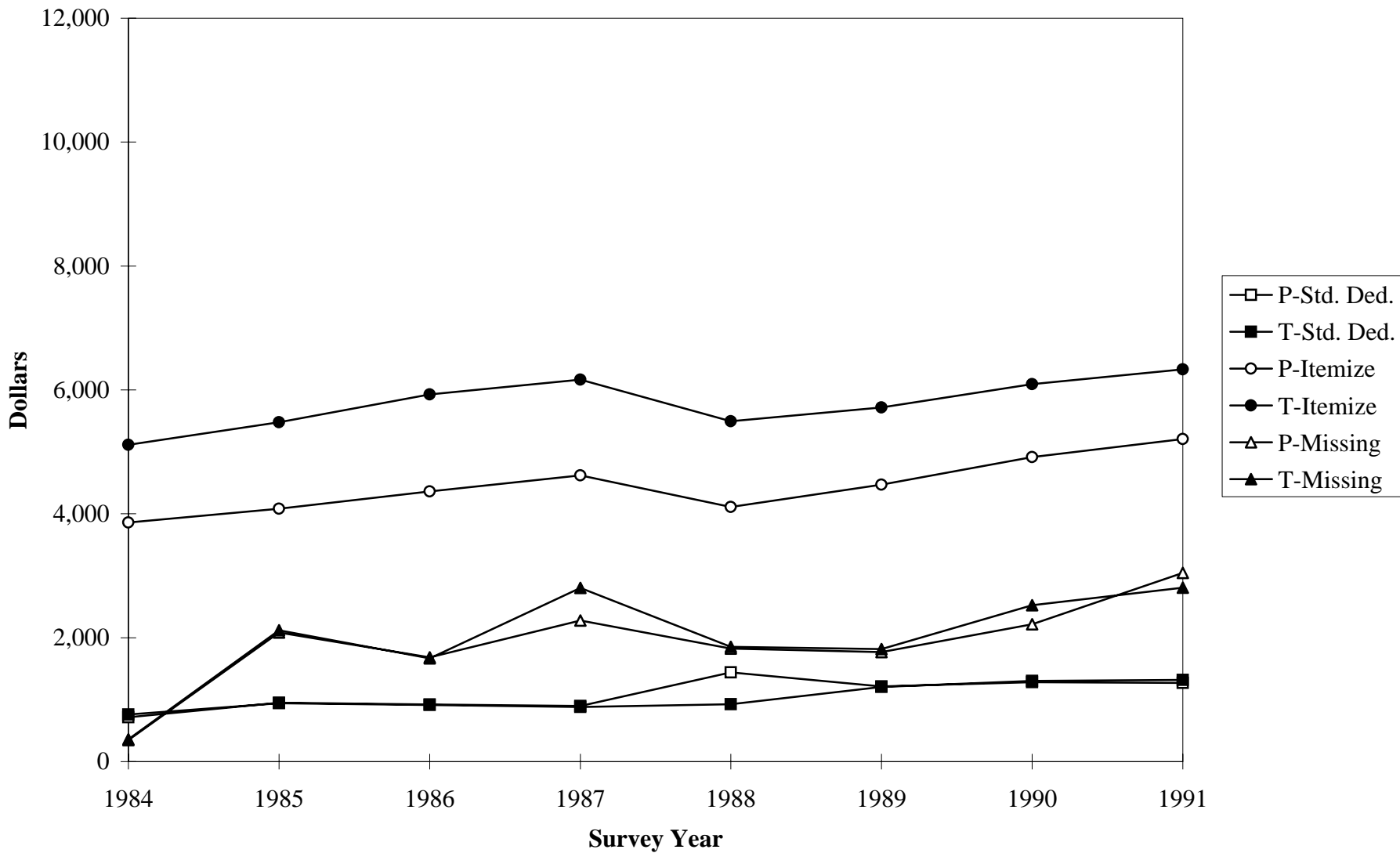


Figure 6a
Comparison of Mean Tax Burdens Using the PSID (P) and TAXSIM (T) by Income Group For
Individuals Living in Households Where No One Itemized

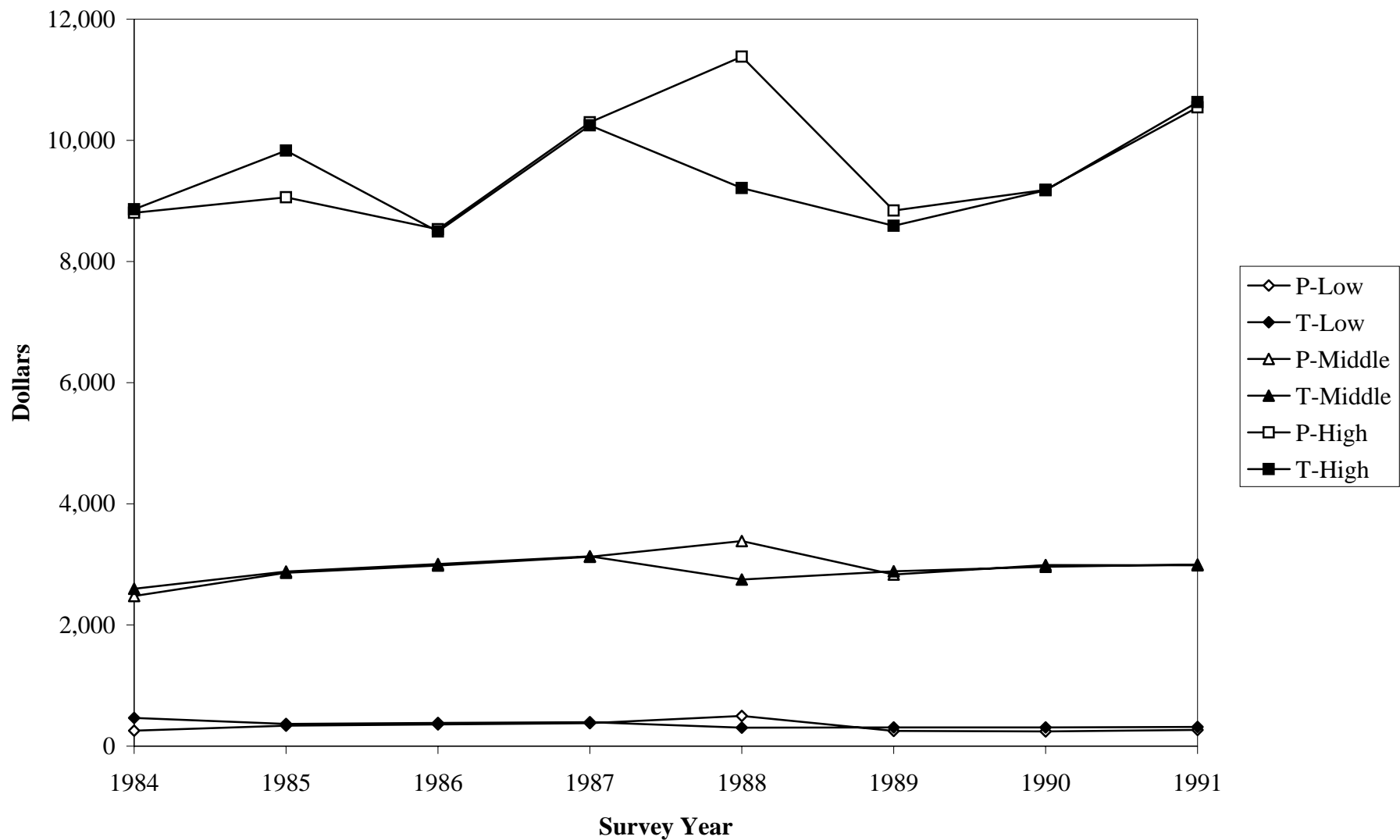


Figure 6b
Comparison of Median Tax Burdens Using the PSID (P) and TAXSIM (T) by Income Group For
Individuals Living in Households Where No One Itemized

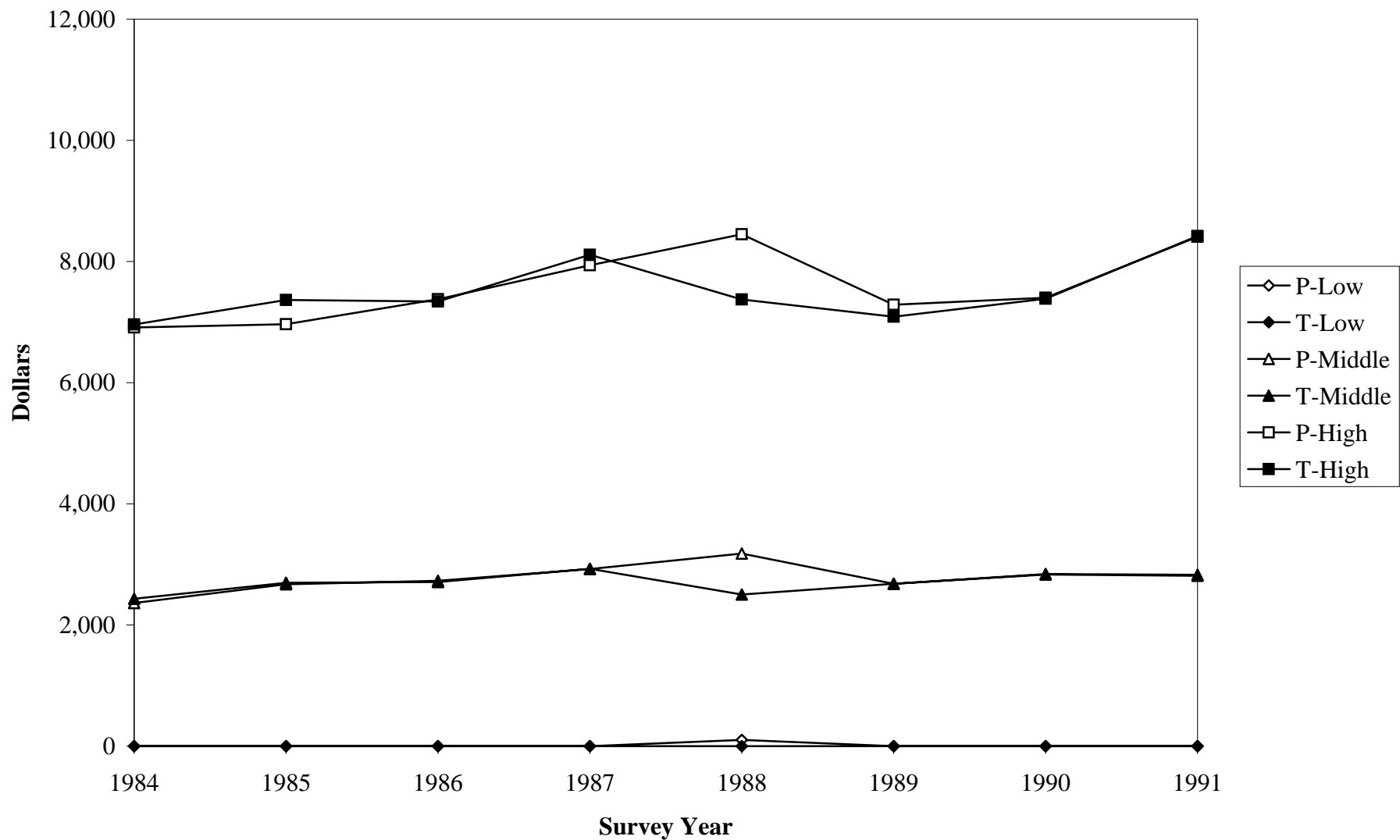


Figure 7a
Comparison of Mean Tax Burdens Using the PSID (P) and TAXSIM (T) by Income Group For
Individuals Living in Households Where the Head Itemized Deductions

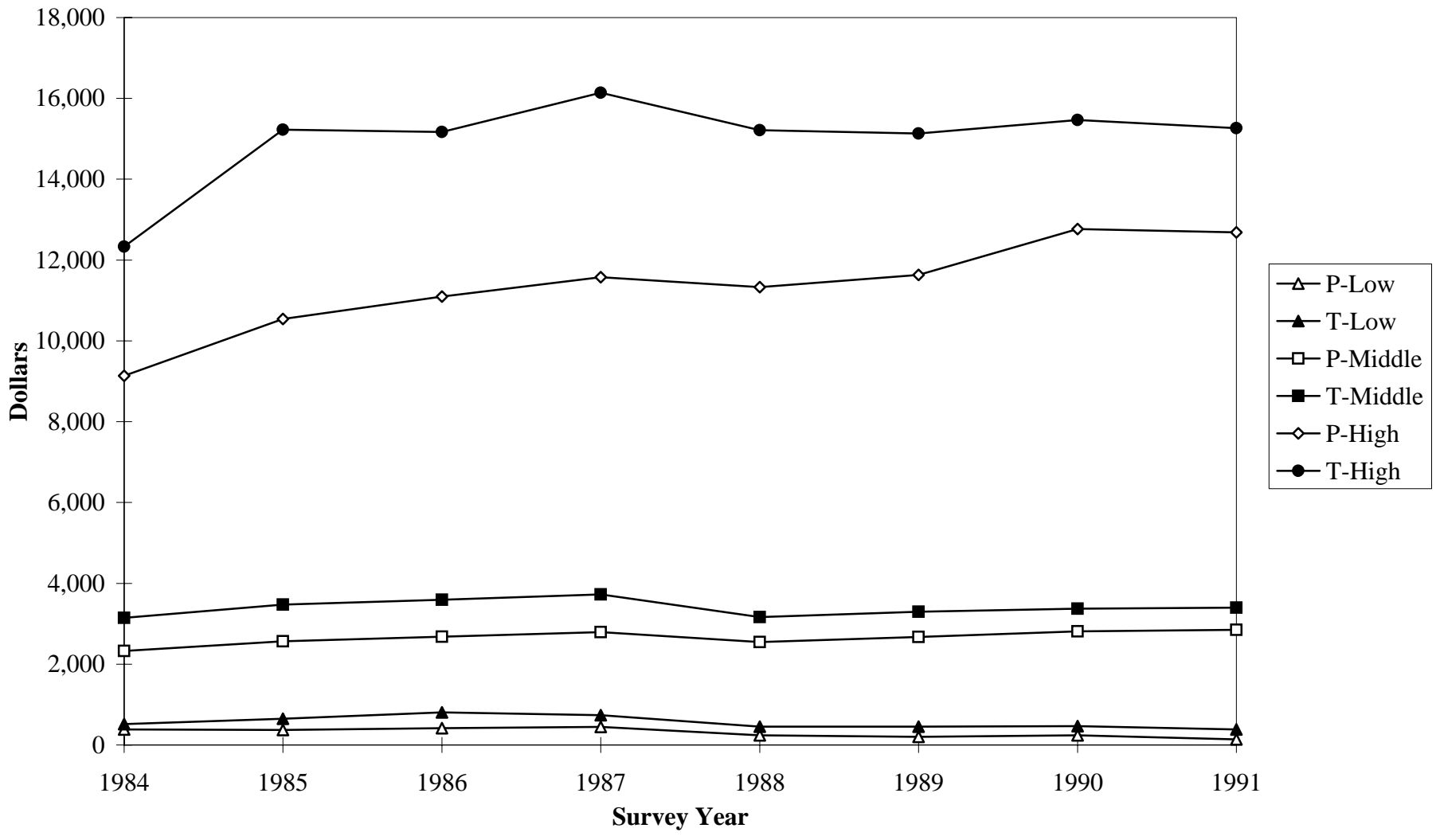


Figure 7b
Comparison of Median Tax Burdens Using the PSID (P) and TAXSIM (T) by Income Group For
Individuals Living in Households Where the Head Itemized Deductions

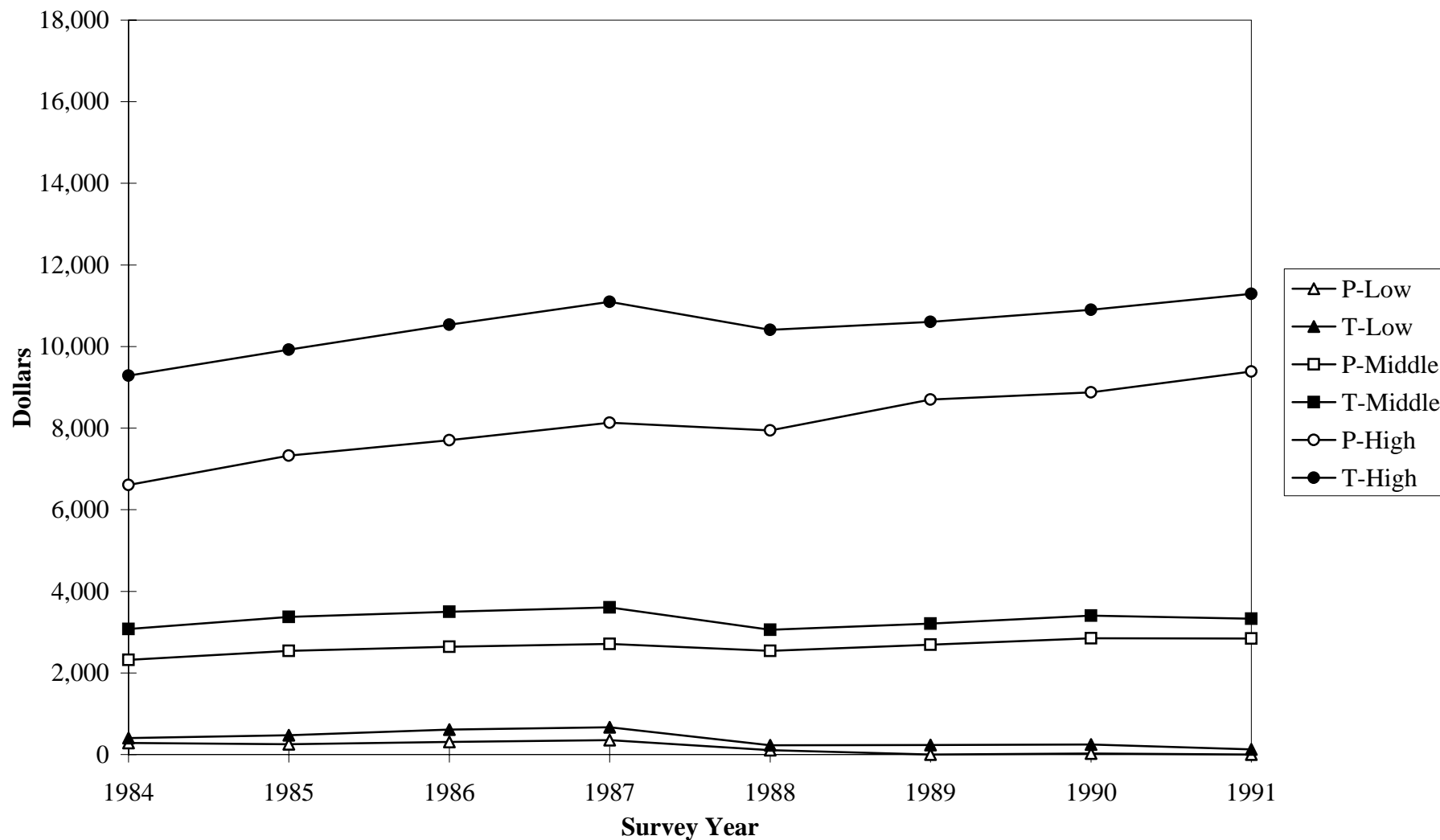


Figure 8a
Comparison of Mean Tax Burdens Using the PSID (P) and TAXSIM (T) by Income Group For Individuals
Living In Households Where the Itemization Indicator is Missing

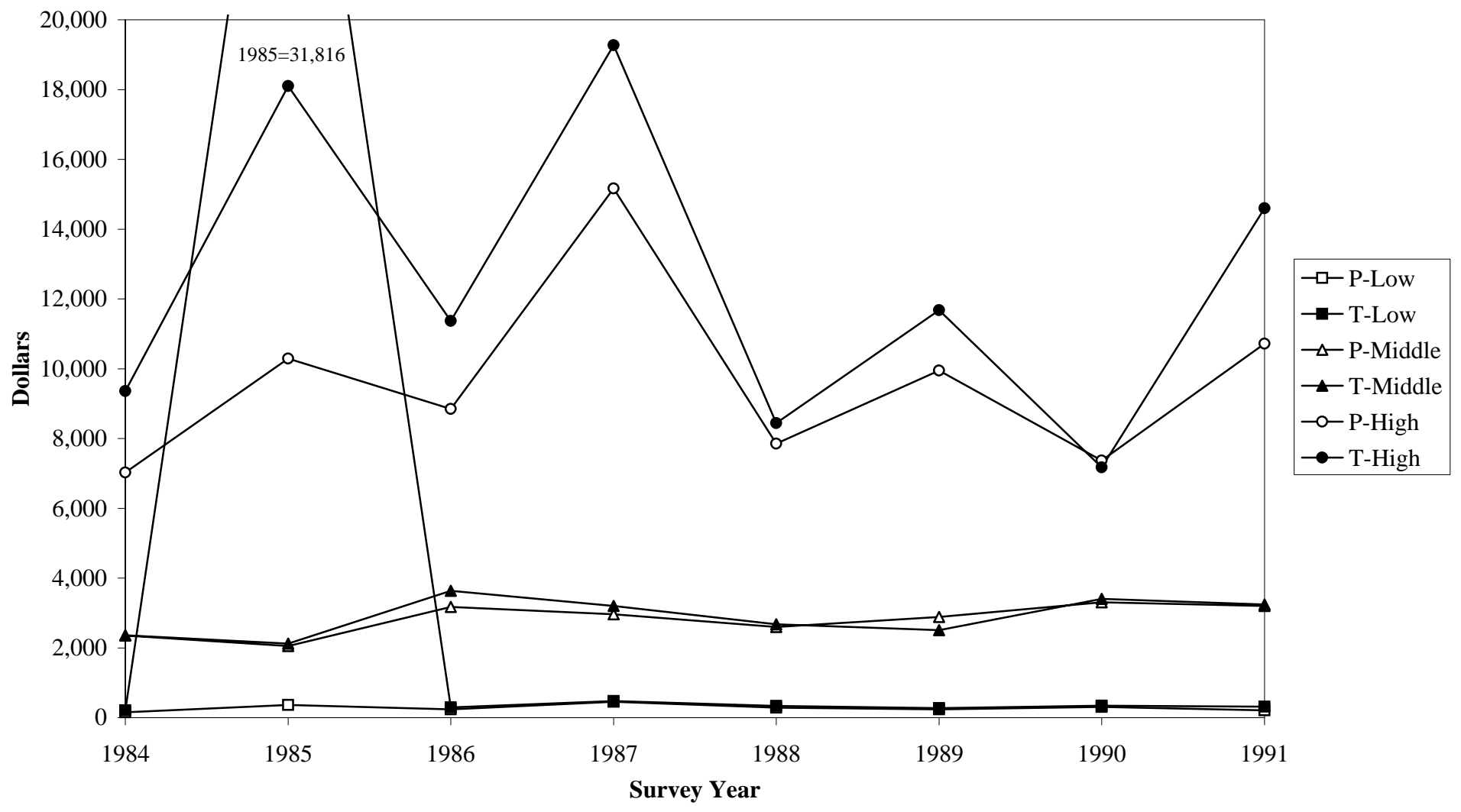
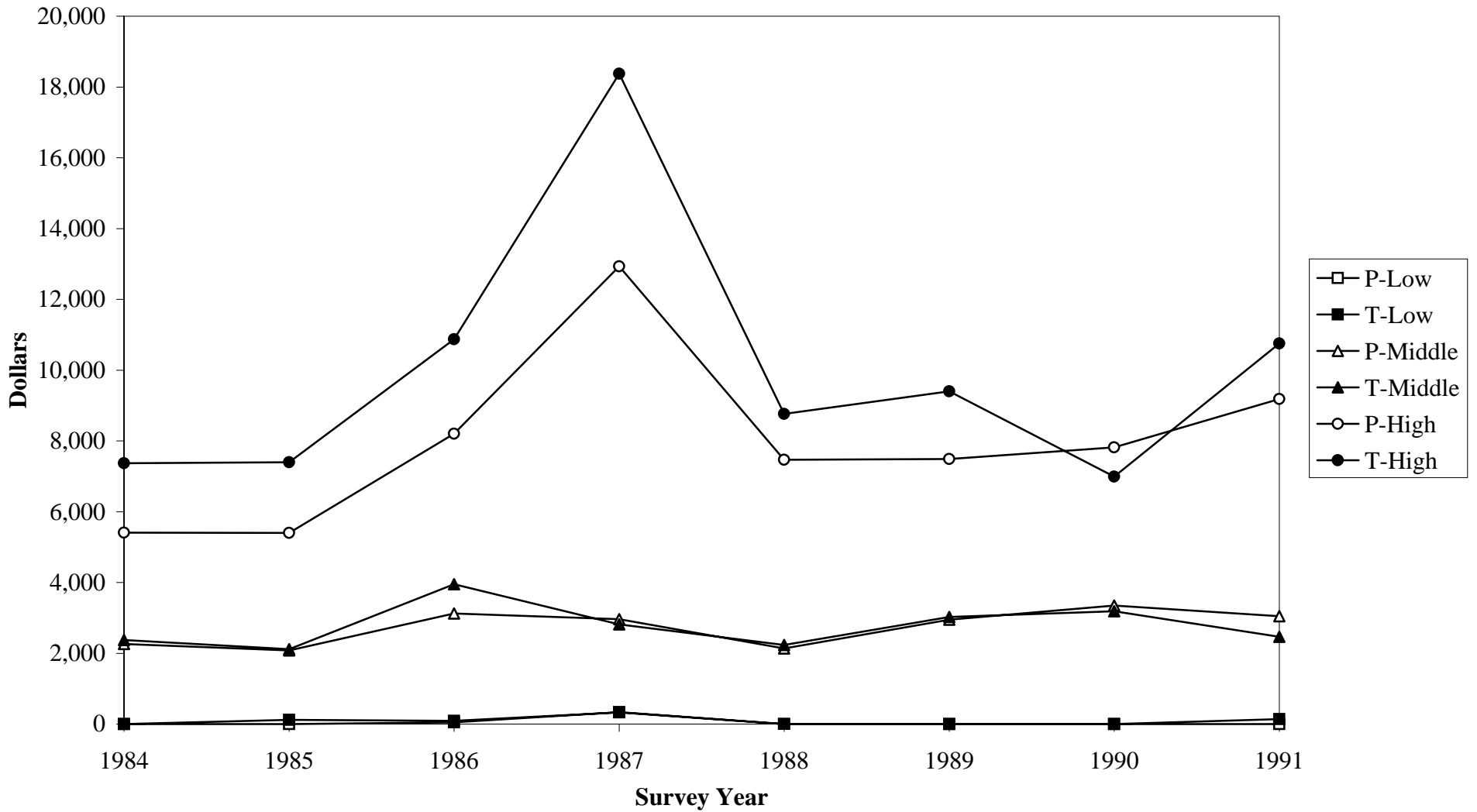


Figure 8b
Comparison of Median Tax Burdens Using the PSID (P) and TAXSIM (T) by Income Group For Individuals
Living In Households Where the Itemization Indicator is Missing



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