Documentation for a Comprehensive Historical U.S. Federal and State Income Tax Calculator Program

Abstract:
This paper provides documentation for a tax calculator program that models federal and state personal income taxes at a high level of detail for a large number of years. The current edition of the program covers federal personal income tax law from 1913 through 2009 (with projected future law through 2015), and state income tax laws from 1900 through 2007. The documentation explains the structure of the program, provides a variable-by-variable description of the data, and supplies references to sources of information on historical tax laws. [JEL Classifications: H20, H24, H71. Keywords: Personal Income Taxation, Federal Income Tax, State Income Tax.]

Jon Bakija
Department of Economics
Williams College
Williamstown, MA 01267
jbakija@williams.edu

This version: August 11, 2009

CONTENTS

	Acknowledgements	p. 2
I.	Overview	p. 3
II.	Structure of the program	p. 3
III.	Sources of information	p. 9
IV.	Capabilities, limitations, and technical details of *IncTaxCalc*, and comparison with Internet *Taxsim*	p. 12
V.	Testing	p. 21
VI.	Input data set	p. 23
VII.	Output data set	p. 32
VIII.	Data set with state tax law parameters	p. 43
IX.	Data set with federal tax law parameters	p. 116
X.	Description of recent changes	p. 138
XI.	References	p. 155

Acknowledgments
This tax calculator was developed largely while I was a visitor at the Brookings Institution and the Congressional Budget Office, and I would like to thank both for hosting me. Financial support from the Urban-Brookings Tax Policy Center, the Brookings Institution Model-Okun Fellowship, Williams College, the Congressional Budget Office, and the Urban Institute are gratefully acknowledged. Outstanding research assistance was performed by Vladimir Andonov, Manijeh Azmoodeh, Diana Carligeanu, Misha Dworsky, Brennan Kelly, Erica Johnson, Edvard Major, Yan Lau, Virginia Lewis, Chris Lyddy, Jonathan Morgenstern, Alex Rees-Jones, Rosemary Smith, Mac Stone, Drew Thomas, Lenisa Vangjel, and Christine Yoon. David Lenter supplied much-needed advice on legal research. Thank you to Joel Slemrod and Bill Gale for helping to support this project, and to Rob McClelland and Ed Harris for valuable programming suggestions. Brad Heim provided extensive and much appreciated help with testing and debugging of the calculator. I am also grateful for assistance provided by the library staffs at the Brookings Institution, Georgetown University Law Center, the Library of Congress, and Cornell Law School.

I. OVERVIEW

IncTaxCalc is a federal and state personal income tax calculator program written in SAS that currently covers state law for 1900 through 2007, and federal law for 1913 through 2015. The current edition of the calculator includes all major features of federal and state personal income tax laws in all of these years. This preliminary version of *IncTaxCalc* is not currently available to the public, and can only be used by permission of the author. I may make it freely available to the public at some future date. The intended uses of the program are to support economic research, and to perform simulations of the impacts of potential policy reforms. Among other applications, the Urban Institute is currently using a portion of the program under contract to serve as a component of its MINT and DYNASIM microsimulation models. Any research making use of the calculator or results from the calculator should cite this document for the time being.

II. STRUCTURE OF THE PROGRAM

Tax law data

IncTaxCalc consists of a single SAS program (*IncTaxCalc*.sas) and two space-delimited ASCII text files: IncTaxFed.dat (which contains the parameters of federal income tax laws) and IncTaxState.dat (which contains the parameters of state income tax laws). In each of the text files, there are three rows (records) for each calendar year between 1900 and 2007 (or 2015 for federal) during which a personal income tax existed for the federal government or the state in question, with one row for each filing status (single, married, and head of household). Each column represents a different variable containing information about some aspect of the tax law. The tax law information can easily be edited, updated, or changed for policy simulation purposes by importing each text file into an Excel spreadsheet, and cutting and pasting the variable names (which are supplied in the top row of the spreadsheets StateLabels.xls and FedLabels.xls) into the top row of the appropriate new spreadsheet. The revised data (without the variable names) can then be copied back into a text file so that the tax calculator program can read it. We use simple ASCII text files to facilitate transportability across platforms.

Input data set with taxpayer information

The user must supply an input data set containing information on each taxpaying unit. There are 68 variables included in the input data set, representing various characteristics of the taxpaying unit (e.g., marital status, age of primary taxpayer and spouse, number of children, etc.) and the values of various components of income and deductions. The input data set is described further in section V below.

How it works

The program works by taking each individual taxpayer record, which contains individual-specific information on year, state, age, values of components of income, potentially deductible expenses, and certain credits, and then merging it with the applicable federal and state tax law parameters from IncTaxFed.dat and IncTaxState.dat. To speed processing, the calculator actually uses the “lookup table” approach in SAS (relying on

the “key=” feature of the “set” statement and indexed data sets) instead of the “merge” statement. The calculator then runs through the records all at once to calculate tax liabilities and other variables of interest. First, federal tax liability is calculated. Then state tax liability is calculated, and the federal tax variables that were just calculated in the first step are used to help compute state tax liability (for example, this takes into account if federal taxes are deductible at the state level, if state itemization status is required to be the same as federal, if there is a state AMT that depends on the federal AMT, etc.). Then federal tax liability is re-calculated, using the state tax liability calculated in the previous step to calculate itemized deductions (and anything else in the federal tax that depends on state taxes). Federal itemization status is chosen to minimize combined federal-state income tax liability. Then state tax liability is recalculated using the newly recalculated federal tax variables from the previous step. And so on, for six iterations each of the federal and state tax computations. Then, once that is done, a small increment ($0.10) is added to some variable chosen by the user (say, wage and salary income of the primary earner), and then the entire set of iterations is done again. The marginal tax rate (**mtr**) is then the change in combined federal-state tax liability caused by adding the increment, divided by the size of the increment; the federal marginal tax rate (**mtrf**) is the change in federal tax liability divided by the size of the increment; and the state marginal tax rate (**mtrs**) is the change in state tax liability divided by the size of the increment. So this fully takes into account *all* interactions between federal and state income taxes -- deductibility of state taxes at the federal level, deductibility of federal taxes at the state level where applicable, and lots of other complicated interactions as well, having to do with the AMT, itemization status, etc. Finally, the program produces a basic output data set with tax liability and tax rate information, or optionally produces a more detailed data set with the basic output plus information on many details of the tax calculation.

User-selected options within the SAS program
There are a number of options that the user can modify, all of which are included at the very top or the very bottom of the SAS tax calculator program (*IncTaxCalc.sas*).

Top of program: relevant pathnames on the local computer system need to be specified at here.

Bottom of program: At the bottom of the program, the user can select a variety of options by choosing the values of the "parameters" of the *IncTaxCalc* SAS macro command, which is reproduced below:

```
%IncTaxCalc(
programpath= ,
inputpath= ,
outputpath= ,
inputset= ,
outputset= ,
fedparam= ,
stateparam= ,
loadparam= ,
mtrvar= ,
incrementkind= ,
incrementquantity= ,
detail= ,
inputformat= ,
outputformat= ,
reverseMTR= ,
checkMTR= ,
statecodetype= ,
yearstart= ,
cbinclude= ,
local= ) ;
```

Each name to the left of an equals sign within the parentheses above is a macro "parameter." Options can be chosen by filling in values to the right of each equals sign. The meaning of each parameter, and its possible values, are given below.

programpath — Pathname of directory where program and federal and state tax law parameter data sets are stored. Do not put slash at end. (Example: C:\files\taxcalc).

inputpath — Pathname of directory where data on individual taxpayers are stored. Do not put slash at end.

outputpath — Pathname of directory where output data sets containing calculated tax rates, tax liabilities, details of tax calculation, and log file are sent. Do not put slash at end.

inputset — Name of input data set with individual taxpayer information. Do not include any file extension.

outputset Name of output data set containing calculated tax rates, tax liabilities, and details of tax calculation. Do not include any file extension.

fedparam Name of data set containing parameters of federal law. Do not include file extension. For baseline federal tax parameters use *IncTaxFed*.

stateparam Name of data set containing parameters of state law. Do not include file extension. For baseline state tax parameters use *IncTaxState*.

loadparam Specify whether to load the federal and state tax law parameter data sets.

0 -- No, do not load the text tax law parameter data sets. You may want to choose this option if you have already run the *IncTaxCalc* macro at least once during this SAS session and do not want to change the parameters of federal or state laws. In that case, the program will just read the temporary SAS data sets for federal and state tax law parameters that are already in the working directory, which will slightly reduce processing time.

1 = Yes, do load the text tax law parameter data sets. Always choose this the first time you are running *IncTaxCalc* during this SAS session, or if you want to change the tax law parameters.

mtrvar The marginal tax rate is calculated with respect to the variable specified in **mtrvar**. Any income or deduction variable in the input data set can be used.

incrementkind Type of marginal tax rate increment. The marginal tax rate is calculated by adding an increment to the income component or deduction chosen in **mtrvar** above. The increment can be either a fixed dollar amount (**incrementkind**=*dollar*), or a percentage of income (**incrementkind**=*incpct*). If the latter is chosen, the increment applied will be the maximum of (*incpct*/100)***income** or $0.10, to deal with situations where income is non-positive.

incrementquantity Size of increment used to calculate marginal tax rate. If **incrementkind**=*dollar*, then put the dollar amount here. If **incrementkind**=*incpct*, then put the percentage here (e.g., if the increment is 10% of income, then write 10). Note that calculator does not allow the addition of the increment to change itemization status. This helps avoid certain situations that would otherwise

produce enormous marginal tax rates. Because itemization status is held constant before and after adding the increment, marginal tax rate estimates calculated using large increments should be interpreted with caution. If **incrementquantity** = 0 the calculator will not perform marginal rate calculations. If you do not need marginal tax rates, the **incrementquantity** = 0 option will save you some time because it will reduce the number of iterations that the calculator performs.

detail Indicator for whether to produce an output file containing only the basic tax results, or an output file containing the details of the tax calculations.
0 = Produce basic output data set.
1 = Produce detailed output data set.
2 = Produce detailed output data set, plus create a separate file containing the values of all variables at the end of each iteration of federal or state tax calculation. Note that the code implementing this is normally commented out of the program, so that choosing **detail** = *2* will just produce the same results as **detail** = *1* unless the user goes into the program and removes the relevant comment lines (which all uniquely include the term "save all variables from all iterations"). This is useful for debugging purposes, but be cautious as this creates a tremendous amount of output. It is best to use this option for test purposes only, with a very small input data set. This produces 27 separate files, named allvars01 through allvars27, with larger numbers representing later iterations. Some of the files will be empty, depending on how many iterations the calculator actually executed (for example, allvars19 through allvars27 will be empty if the program did not re-calculate marginal tax rates a second time after subtracting an increment from a variable). The relevant code is normally commented out to avoid creating 27 unnecessary empty files. Some useful reference variables in this output data set include: **iteration** (which equals 1 before an increment is added to a variable to calculate marginal tax rates, 2 after adding the increment, and 3 if marginal tax rates are being re-calculated after subtracting an increment); **deductcycle** (which ranges from 0 to 6, increases by one each time the federal tax calculator is executed, and resets to zero when **iteration** increases); and **lastcalc**, which indicates which portion of the calculator, state, federal, or none, was most recently executed.

inputformat Format of input data set.
0 = Tab delimited text
1 = Permanent SAS data set
2 = Temporary SAS data set in working directory. If this option is chosen, the program will assume that the data set specified in

inputset above is a temporary SAS data set in the working directory, and will ignore **inputpath**. Choosing this option can speed processing a bit if your **inputset** is already in working memory.

outputformat Format of output data set.
0 = Comma delimited text file
1 = Permanent SAS data set.
2 = Temporary SAS data set. If this option is chosen, a temporary SAS data set is written to the working directory, and **outputpath** above is ignored.

reverseMTR Optional alternative marginal tax rate calculation to eliminate notches. When set to *0*, marginal tax rate will be calculated by adding an increment to the variable specified in **mtrvar**. If **reverseMTR** is set to *1*, then marginal tax rates will be computed first by adding an increment to the initial value, and then, if the absolute value of the marginal rate is greater than the value of **checkMTR** below, it will be calculated again by subtracting the increment from the initial value. Results will be reported for the case where the overall marginal tax rate is smallest in absolute value. When **reverseMTR** = 1, the calculator will also perform the alternative marginal rate calculation if **mtrfns** > **checkMTR**, in which case results are reported for the case where the maximum of the absolute values of **mtr** and **mtrfns** is minimized. (The **mtr** is the overall marginal tax rate, and the **mtrfns** is the federal marginal tax rate computed setting state income taxes to zero).

checkMTR Absolute value of marginal tax rate, expressed as a decimal, above which the **reverseMTR** calculation described above will be performed.

statecodetype Type of state code in input data set.
0 = Two-letter postal abrreviation.
1 = IRS Statistics of Income 2-digit numeric code.

yearstart Earliest year of federal or state tax parameter data needed. Setting this to a later year can speed processing time.

cbinclude Include circuit breaker property tax credits in income tax calculation? Note that a completely accurate circuit-breaker calculation would require information on property tax for non-itemizers, rent, and in a few cases home value.
0 = Ignore all circuit breaker property tax credits

1 = Only include circuit breakers that are implemented through the income tax.
2 = Include circuit breakers that are implemented through the income tax, plus any rent circuit breakers that are not on the income tax form.
3 = Include all circuit breakers including those that have nothing to do with the income tax.

local Include local income taxes? Warning: currently, the tax calculator only allows for a very a rough approximation of local income taxes, and only for 1977 an later years. See documentation for the variables **localrate** and **localtype**.
0 = Do not calculate local income tax bill.
1 = Calculate local income tax bill for all states with local income taxes.
2 = Calculate local income tax bill only for states that have significant local income taxes that apply throughout the state (Indiana, Maryland, and Pennsylvania). Note that local tax calculations for these states are considerably more accurate than for other states.

Note that it is also possible to store the whole program as a compiled macro and then to call it from within another SAS program using the SAS Autocall facility. To do this, take the following steps:

1) Create a directory to store SAS macros (e.g., C:\SASmacros).
2) Copy *IncTaxCalc*.sas into that directory
3) In the SAS program where you want to invoke the tax calculator, write the following lines of code at the top of the program:

```
filename macs "c:\SASmacros" ;
options mautosource ;
options sasautos=macs ;
```

4) Write a line of code in your program that invokes the *IncTaxCalc* macro, i.e.,

```
%IncTaxCalc() ;
```

Where all of the parameters noted above are included in the parentheses.

SAS Log File

The calculator program can be modified to send the SAS log file to a file called IncTaxCalc.log, in the directory specified in the *outputpath* option described above. This avoids problems that occur when the log file exceeds the maximum length for the SAS log window. This can be accomplished by un-commenting the following lines that are present near the top of IncTaxCalc.sas:

```
PROC PRINTTO LOG=" &outputpath.\IncTaxCalc.log " NEW;
RUN;
```

III. SOURCES OF INFORMATION

For the federal income tax, our sources of information included the tax forms, instructions, and glossary of terms included annually in the IRS Statistics of Income *Individual Income Tax Returns* publication, forms and instructions provided to us by the IRS for each year since 1913, and forms and instructions accessed through the IRS web site <http://www.irs.gov> for years since 1992.

For state income taxes, we used a variety of sources. For recent years, we relied heavily on state income tax forms and instructions posted on the web (see, for example, http://www.taxadmin.org/fta/link/forms.html for links to forms and instructions from all states). For earlier years, our primary sources of information were the state tax laws themselves. A snapshot of all of a state's laws applying at a given point in time is provided in each state's "annotated statutes," and the laws passed by the legislature in each year are contained in the state's "session laws." "Cumulative supplements" are also published periodically; these include the up-to-date text of any sections of the law that have been amended since the last edition of the annotated statutes was published. The Lexis-Nexis legal research database contains a searchable collection of current annotated statutes, and state session laws going back to 1989. For earlier years, we made use of the excellent collections of historical state laws at the Georgetown University Law School library and the Cornell University Law School library. We were able to find annotated statutes and cumulative supplements for numerous years spanning the 20th century for each and every state. Historical notes in the annotated statutes indicate dates of amendment and reference information for the amendments for each section of the law, and in some cases describe the amendments. The amendments themselves (contained in the session laws) were retrieved in any cases where there were gaps in information between available statutes, when they could not be definitively resolved using other sources at our disposal.

We used a wide variety of other sources to help reconstruct the histories of state tax laws. At the Library of Congress, we found tax planning guides that included forms and instructions for all states for 1970, 1971, 1974, and various years between 1975 and 1978 (differing by state). A variety of secondary sources were also used. Particularly valuable for the early years was Prentice Hall's *Tax Diary and Manual*, which contained very detailed synopses of each state's tax law, and was available at the Library of Congress for almost all years between 1922 and 1954. Through interlibrary loan we were able to find copies of the extremely helpful *All States Tax Handbook* for most years

between 1976 and the present (this was published in different years by Prentice Hall, Maxwell Macmillan, and Research Institute of America). Advisory Commission on Intergovernmental Relations publications, such as *Significant Features of Fiscal Federalism*, provided information on state income taxes for most years between 1961 and 1994, at varying levels of detail depending on the year. Commerce Clearing House's *State Tax Handbook*, which includes information on brackets, rates, and exemptions, was available for most years between 1964 and 1993. The *Book of the States*, published bi-annually by the Council of State Governments, provided summaries of major changes in state tax laws enacted by state legislatures for each year between 1942 and 1993. U.S. Bureau of the Census' 1922 *Digest of State Laws Relating to Taxation and Revenue* includes fairly comprehensive descriptions of each state's tax law for that year. The Tax Foundation's *Facts and Figures on Government Finance* provided limited information (usually top and bottom rates and exemptions) roughly every other year from 1942 to the present. The National Industrial Conference Board's *State Income Taxes* (1930) described the laws as of 1929 and also included histories noting major changes in each state's income tax between its inception and that date. Blakey and Johnson (1942) provided a comprehensive explanation of state income tax laws as of 1942, and Greene (1958) provided tax rates and a few other items of information (e.g., capital gains exclusions) for 1958. The Tax Foundation's *Retail Sales and Individual Income Taxes in State Tax Structures* (1962) included useful information on state treatment of capital gains. Bogart and Gentry (1995) provide some information on state treatment of long-term capital gains between 1979 and 1990. A number other useful resources are listed in the References.

We kept extensive notes on each state, including sources of information for each aspect of state tax law coded into the calculator, as well as explanations of a few isolated areas where we had to make inferences or assumptions due to lack of information. Further information is available upon request.

Finally, decisions about how to structure the program and how to deal with various complications caused by the tax law (for example, "notches" that produce large marginal tax rates) benefited from information about NBER's *Taxsim* model provided in Feenberg and Coutts (1993) and in the notes accompanying the Internet version of that program (http://www.nber.org/~taxsim/).

Almost all of the sources of information that we used to construct our calculator have now been electronically scanned, and are stored as carefully indexed (but not internally searchable) PDF image files.

IV. CAPABILITIES, LIMITATIONS, AND TECHNICAL DETAILS OF *INCTAXCALC,* AND COMPARISON WITH NBER'S INTERNET *TAXSIM*:

This section summarizes some of the capabilities, limitations, and technical details of *IncTaxCalc*. It also offers a comparison to the features offered by version 8.0 of NBER's Internet *Taxsim*, for the benefit of those who are familiar with that program. Any comparisons below refer exclusively to the Internet version of *Taxsim*, since the full internal NBER version is not publicly available and we do not have full information about its capabilities.

- **Years**
  IncTaxCalc currently covers the years 1913 through 2015 for the federal income tax, and 1900 through 2007 for state income taxes. Internet *Taxsim* currently covers federal law from 1960-2015, and state law for 1977-2008. In *IncTaxCalc*, projections of federal law for 2009 through 2015 are based on current law as of June 11, 2009, with inflation adjustments based on the Congressional Budget Office's January 2009 projections.

- **Portability**
  IncTaxCalc is portable. As a result, it can be used with government data sources that, for confidentiality reasons, cannot be directly accessed by anyone but a limited group of government employees. Submitting such restricted data to the NBER for use with either the Internet or internal versions of *Taxsim* would violate confidentiality regulations. By contrast, *IncTaxCalc* can be used with such data, because government employees who are authorized to work with the data can download the program directly to their computers.

- **Policy simulations**
  IncTaxCalc has been designed in such a way that it will be fairly easy to adapt it to simulate the effects of proposed tax reforms. For example, the effects of changing various parameters of federal or state tax law can be modeled by changing the values of those parameters in a spreadsheet and then running the calculator using this modified parameter data.

- **Itemized deductions**
  IncTaxCalc allows users to input data on each type of itemized deduction separately, and accurately models state and federal treatment of each type of deduction. Internet *Taxsim* collapses itemized deductions into three broad categories (property taxes, deductions such as mortgage interest that are not preferences for the AMT, and other itemized deductions).

- **Capital gains**
  IncTaxCalc incorporates an approximation of the various federal and state provisions affecting the taxation of long-term capital gains. The input data set for *IncTaxCalc* allows users to specify the value of any long-term capital gains that are subject to preferential treatment, and to separately specify the value of any other capital gains or

losses that are not subject to preferential treatment. The calculator then takes into account the effects of any exclusions, special tax rates, and alternative maximum taxes applying to long-term gains, albeit in a somewhat simplified fashion. For example, when long-term gains of different holding periods are taxed at different rates, *IncTaxCalc* assumes the "long-term" gains qualify for the longest holding period. Interactions between these and other features such as maximum and minimum taxes are accounted for as well. Internet *Taxsim* now offers roughly similar treatment of capital gains.

- **Minimum and maximum taxes**
  IncTaxCalc models the federal minimum tax, alternative minimum tax, and maximum tax on earned income, as well as state minimum and maximum tax provisions. *IncTaxCalc* allows the user to input taxpayer data on each type of itemized deduction, long-term capital gains, and summary values of other minimum tax or alternative minimum tax adjustments or preferences that not derivable from other variables already in the input data set. All of these features are then taken into account appropriately in calculating minimum and maximum taxes. Internet *Taxsim* also includes approximations of the federal minimum tax, alternative minimum tax, and maximum tax on earned income, and appears to include state minimum taxes. The *IncTaxCalc* approximations should be more accurate in this case due to a richer array of input variables.

- **Income averaging**
  IncTaxCalc includes a rough approximation to federal income-averaging laws that applied from 1964-1986, and allows users to input the variable for average lagged taxable income that is necessary to compute tax under income averaging (information on this may be available, for example, in panel data). We have not incorporated any state income averaging provisions, which in any event were quite rare (California is one example).

- **"Circuit-breaker" property tax and rent credits**
  IncTaxCalc now includes state "circuit-breaker" credits for property taxes and rent payments, as does NBER Internet *Taxsim*. Some of these credits are incorporated into state income tax forms, while others are administered separately from the income tax. Internet *Taxsim* only includes circuit breaker credits administered through the state income tax form. In *IncTaxCalc*, users can choose which kinds of circuit breaker credits to include in the tax calculations and which kinds to leave out.

- **Treatment of other credits**
  At the federal level, *IncTaxCalc* computes the EITC, child credit, credit for child care expenses, and credit for the elderly endogenously, but takes the value of other federal credits as given. At the state level, any general credits, child care credits, credits for the elderly or retirement income, low-income credits (except for circuit-breakers), and state EITCs are computed endogenously. Any other state credits are currently ignored. It is not entirely clear which credits are computed endogenously by Internet *Taxsim,* but the list appears to include EITC, child credits, credits for child care

expenses, and possibly credits related to retirement income and pensions or targeted to low-income people; other credits are apparently also ignored by Internet *Taxsim*.

- **Treatment of social security benefits and unemployment compensation**
  IncTaxCalc accurately models both federal and state treatment of social security benefits, and it appears that Internet *Taxsim* does the same. For unemployment compensation, *IncTaxCalc* accurately models federal treatment, but assumes that state treatment is the same as federal. We know that this assumption is incorrect in many cases, have collected the data necessary to get it right, and intend to incorporate it in a future version. It's not clear but it appears that Internet *Taxsim* may accurately incorporate differences between federal and state treatment of unemployment insurance.

- **Differences between federal and state treatment of interest income**
  The federal income tax exempts interest on state and local government bonds, and taxes interest on federal government bonds. Some, but not all, state income taxes differ from this federal approach. In a number of cases, the states exempt federal bond interest, and tax state and local government bond interest (often exempting interest from their own state's bonds). Neither *IncTaxCalc* and *Taxsim* incorporate differences between federal and state taxes in which sorts of interest are taxed. *IncTaxCalc* does include variables for both "interest" and "federally tax-exempt interest" in the input data set; the former is assumed to be taxable interest at both the federal and state levels, while the latter is only used for computing the income measures used for the phase-in of social security benefit taxation and the phase-out of the earned income credit.

- **Adjustments to income**
  In *IncTaxCalc*, federal adjustments to income and "above the line" deductions, such as IRA contributions and student loan deductions, are not modeled in much detail. *IncTaxCalc* accurately models employee business expenses, moving expenses, the two-earner deduction, and the adjustment for one-half of social security taxes on self-employment income. But it takes other adjustments, such as IRA and Keogh contributions, as given (these are supplied by the user in the taxpayer input data set in the variables **othadj1** and **othadj2**). Eligibility, phase-outs, etc. are not endogenously calculated for these other adjustments. Internet *Taxsim* does not have an input variable for adjustments, but may compute some adjustments (such as the two-earner deduction) endogenously from other information in the input data set.

- **Business income**
  Federal personal income tax treatment of income from partnerships, S-corporations, and sole proprietorships is assumed to apply at the state level as well. Our review of historical state tax laws suggests that in some cases state personal income taxes treated some of these forms of income differently than the federal income tax did, but we have not yet attempted to incorporate these differences into the calculator.

- **Other approximations.**

Some particularly complex features of the tax code have been approximated with simpler representations. One example in *IncTaxCalc* is that full details on how to calculate the amount of capital gains subject to varying kinds of special treatment are not modeled. Rather, users are asked to input a single variable representing a summary value of long-term gains subject to special treatment, and the calculator assumes that the treatment applying to gains with the longest holding period applies. There is then one other variable for capital gains not subject to special treatment, or losses. Similarly, features such as alternative minimum taxes, minimum taxes, maximum taxes, and income averaging provisions are as accurate as possible given the 68 variables we have specified in the input data set, but there are still a number of approximations arising from the fact that complete accuracy would require information on a lot more than 68 items.

Joint versus separate filing and division of income and deductions between spouses

In the federal income tax before 1948, and in many states to this day, the bracket and rate structure is the same regardless of marital status. In those cases, it is usually advantageous for married couples to file separate returns in order to reduce the marriage penalty. The division of income, deductions, exemptions, and credits between spouses can affect tax liability in these cases.

To determine whether a married couple files jointly or separately, *IncTaxCalc* adheres to the following rules:

- Married couples are assumed to file jointly in the following cases: (1) at the federal level in all years from 1948 on; (2) in all community property states in all years; (3) in any state that had different tax brackets for people of different marital statuses; (4) in any state where taxpayers were required to choose the same filing status as federal in any year from 1948 on; (5) in any state where filing separately was explicitly disallowed; and (6) in any state that had a single tax rate (except in the case where **mardedtype** = 11 – see below). In all of these cases, filing jointly would generally result in a tax liability that was less than or equal to the liability from filing separately. For example, in the case of community property states, throughout history, their income taxes effectively imposed tax brackets on married couples that were twice as large as those for singles, and all income was treated as being earned 50% by each spouse, so that filing separately and filing jointly were exactly equivalent at the state level. In 1948 and later years, there have occasionally been some rare exceptions to the rule that joint filing is always advantageous for married couples – for example, it could be advantageous to file separately when medical expenses are very large. The calculator ignores those rare exceptions.

- In the few rare cases where joint filing was not allowed under state law, the calculator always computes tax liability based on separate filing.

- In all other cases, the calculator computes tax liability for married couples under both joint and separate filing, and then chooses the one that produces the lowest tax

liability for the couple. In these cases, filing separately is almost always advantageous. But joint filing could be advantageous, for example, if one spouse had large losses which could be used to offset the income of the other spouse. Also, in general, joint and separate filing produce the same result when combined taxable income falls completely into the first tax bracket.

When spouses file separately, income, exemptions, deductions, and credits are allocated to each spouse based on the following rules:

- The user specifies how each item of income is allocated between spouses in the input data set.

- Whenever the state or federal tax law leaves discretion about how to allocate deductions and exemptions between spouses filing separately, the calculator divides them so as make the taxable incomes of each spouse as close to equal to each other as possible, which is generally consistent with tax minimization. This is because states' graduated marginal tax rate schedules were generally strictly non-decreasing in income. It is true that in a number of cases, phase-outs of various provisions could cause "bubbles" where the marginal tax rate in one income range was lower than the marginal rates imposed at higher incomes. Generally, however, these phase-outs were based on the combined (adjusted) gross incomes of both spouses, so that changing the allocation of deductions or exemptions between spouses could not help avoid the "bubbles." Therefore, it is generally true that making taxable incomes on each spouse's return as close as possible to each other would yield tax minimization.

- The allocation between spouses of exemptions, standard deductions, and credits follows the rules specified in the relevant state or federal law. In cases where there is some discretion (for instance, in some cases an exemption for married couples could be divided between the spouses in any way they choose), the deductions are allocated in order to make the taxable incomes of the two spouses as close to equal as possible. In many cases, it was required that dependent exemptions be claimed by the parent providing more than 50% of material support; this is assumed to the be parent with the higher adjusted gross income. It was a general rule that if one spouse chose to take the standard deduction, the other spouse had to do so as well, and that if one spouse took an itemized deduction, the other spouse had to itemize as well, and the calculator follows this rule.

- For itemized deductions, in almost all cases, when spouses filed separately, federal and state law either required each spouse to report his or her "own" itemized deductions (most of which were easily fungible), or the tax form explicitly stated that the spouses could divide the deductions between themselves in any manner they chose. The major exception was that deductions for income taxes generally had to be divided in proportion to how much tax each spouse actually paid, or, if this could not be determined, had to be divided in proportion to each spouse's share of AGI. In a few states, spouses were required to divide *all* itemized deductions between the spouses in proportion to their shares of AGI.

The calculator allocates itemized deductions between spouses in the following manner. First, any deductible income taxes are either allocated to the spouse who paid them, or divided in proportion to each spouse's AGI when the relevant income tax being deducted was based on a joint return. Second, if the state required itemized deductions to be divided in proportion to each spouse's AGI, the calculator does so. Third, if the state did not impose such a limitation, then all itemized deductions other than income taxes are divided between the spouses in order to make the taxable incomes of the two spouses as close to equal to each other as possible. Because spouses often had more discretion about how to divide itemized deductions between themselves than they did with regards to the standard deduction, it was sometimes the case that itemization could be optimal even when total itemized deductions were less than the standard deduction. As a result, calculations for couples filing separately choose itemization status based on tax minimization rather than on a comparison between the size of itemized and standard deductions.

In the case of federal income taxes deductible in states where separate filing was advantageous prior to 1948, if a married couple filed a joint return, their joint tax liability is divided up for purposes of deductibility against the state tax in proportion to what each spouse's federal tax liability would have been if they had filed separately. This helps avoid notches that might otherwise occur when married taxpayers switch from separate to joint status on their federal returns. Similarly, if a married couple files separately at the federal level before 1948, and lives in a state where either joint or separate filing could be advantageous depending on the circumstances, and joint state tax liability is divided up between spouses for purposes of deduction against federal tax in proportion to what the state tax liability of each spouse would have been had they filed separately. In the case of a tax where it is always advantageous for married couples to file jointly, that tax is divided up among spouses for purposes of deductibility against tax at the other level of government in proportion to the AGI of each spouse.

- Adjustments ("above the line deductions") are allocated between spouses in the following manner. Employment-related business expense and moving expense deductions are allocated in proportion to each spouse's share of labor income (the allocation is held constant when computing marginal tax rates). The adjustment for one-half of social security taxes on self-employment income is allocated between spouses based on the amount of such tax calculated to apply to each spouse. The two-earner couple deduction, when allowed at the state level, was generally only allowed to couples that filed jointly. The allocation of other adjustments between spouses is specified by the user in the input data set (**othadj1** and **othadj2**).

- In the federal income tax prior to 1948, it was generally advantageous for spouses to file separately when both spouses had income. For residents of non-community-property states, each spouse was required to report his or her "own" income and itemized deductions. In the eight "community property" states (Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, and Washington), any labor income, any capital income arising from assets acquired during the marriage, and any itemized deductions were considered to belong equally to each spouse. As a result, married

couples living in community property states generally faced smaller federal income tax liabilities than similar couples in other states. In the federal income tax calculations prior to 1948, the calculator allocates the combined income and itemized deductions of a couple in a community property state 50% to each spouse, regardless of how the income is allocated in the input data set. From 1948 on, it would generally be advantageous for residents of all states to file jointly at the federal level.

To summarize, *IncTaxCalc* allows users to allocate each component of income between spouses in any manner. In cases where separate filing may be optimal for married couples, it then allocates deductions and exemptions between spouses based on tax minimization, subject to any constraints imposed by state or federal law, and then chooses joint or separate filing status in order to minimize the couple's combined tax bills. This does not pose any particular problems with marginal rate notches. In *IncTaxCalc*, marginal tax rates are calculated by adding an increment to any variable in the input data set representing a specific component of income or deductions. Since the input data set contains separate variables for each type of income earned by each spouse, marginal tax rates on income will be calculated with respect to a change in a particular item of income for a particular spouse. This marginal tax rate with respect to an income item will only be affected by changes in the allocation of deductions between spouses in the small number of cases where it is advantageous for spouses to file separately, and where either the state requires that deductions be allocated in proportion to each spouse's share of AGI, or where the spouses' taxable incomes would otherwise be equal to each other (or where the difference between them was smaller than the increment used to calculate the marginal rate). But in those cases this does in fact accurately reflect the effective marginal tax rate on a particular spouse's income. In the case of marginal tax rates with respect to deductions, the input data set only includes the aggregate amount of the deductible expense for the couple as a whole. The marginal tax rate here will be computed based on the assumption that any addition to deductible expenses will be allocated between spouses in accordance with tax minimization, subject to the constraints imposed by the tax law. In most cases, this means that when separate filing is advantageous, the marginal tax rate that is returned will represent the marginal tax rate of the higher-earning spouse. When it is possible for spouses filing separately to equalize their taxable incomes, then the marginal rate will be the un-weighted mean of the two spouses' marginal rates, which is generally the same as each spouse's individual marginal rate in that case.

Notches and Other Sources of Strange Marginal Tax Rates

"Notches" are situations where a small change in income or deduction causes a very large change in tax liability. For example, a number of states operate tax credits or exemptions that are available to anyone with income below a certain level, and zero above that income level. Notches are problematic because they result in very large marginal tax rates that act as influential outliers in a regression analysis.

IncTaxCalc calculates marginal rates by adding a dollar increment to an item of income or deduction, and then dividing the change in tax liability by the increment. Users can choose the size and sign of the increment. Choosing a very small increment (say,

$0.10) will help limit the number of notches. A smaller increment reduces the probability that adding the increment will cause income to cross a threshold that produces the notch. All thresholds in the program are defined as integers, the calculator automatically rounds the initial dollar values of all income and deduction variables in the input data set to the nearest integer, and the program is written so that crossing a threshold requires moving to a new integer value. As a result, adding an increment that is less than $1 to some component of income or deduction is very unlikely to cause a notch threshold to be crossed.

As an additional measure to avoid notches, users can select an optional alternative marginal tax rate calculation. If this option is chosen, and the initial marginal tax rate is greater than some user-selected value, then the marginal tax rate will be computed a second time by subtracting an increment from the initial value. For those cases, the reported marginal rate will be the one where the maximum of the absolute value of overall marginal tax rate (**mtr**) and the absolute value of the federal marginal tax rate computed setting state income tax to zero (**mtrfns**) is smallest. See the discussion of **reverseMTR** in part II above.

Many notches are caused by federal or state credits or deductions that are a step function of income. In cases where the step function involves many relatively small steps, *IncTaxCalc* approximates the step function with a smooth linear function. For example, the calculator applies a smooth linear phase-down of the credit rate in the federal credit for child care expenses. While this reduces the accuracy of the tax liability calculation slightly, it has the advantage that it greatly reduces the likelihood that reported marginal tax rates will be distorted by notches, while at the same time incorporating the effects of the phase-out into the reported marginal rate in a reasonable fashion. In cases where the phase-out step function involves a small number of very large discreet jumps, so that it could not be well-approximated by a linear function, the calculator incorporates the step function directly. In those cases, the notch will not affect the marginal tax rate unless adding an increment to income or deductions causes one to cross a threshold in the step function. Such a notch can then be avoided by using the **reverseMTR** feature described in part II above. Internet *Taxsim* takes a roughly similar approach to this issue.

Interactions between the federal alternative minimum tax and other features of the tax code can also cause some strange marginal tax rates in some rare cases. One issue is that when federal credits are equal to or greater than federal tax liability before credits, the AMT can cause the marginal tax rate on income to be negative. This is because from 1987 on, AMT liability equaled the tentative alternative minimum tax minus tax liability before credits. Increasing income will increase tax liability before credits, and this in turn will reduce AMT liability as long as the marginal AMT rate is less than the marginal ordinary tax rate. When credits are larger than federal tax liability before credits, then the AMT is the only source of tax liability, so higher income can thus reduce tax liability. This is a legitimate feature of the tax code, so the program does not undo this.

Interactions between the AMT and itemized deductions are another important source of complication in some relatively rare situations. If a taxpayer is subject to the AMT, then it is no longer true that choosing the larger of itemized deductions or the standard deduction will minimize tax liability. When taxpayers are subject to AMT, the calculator chooses itemization status based on tax liability minimization, which helps avoid some large but illegitimate notches that would otherwise occur. Things are even

more complicated than that, however, because in some situations, it is optimal to itemize, but increasing itemized deductions beyond a certain point would begin to increase tax liability instead of decreasing it. This can occur, for example, in the situation described above where the taxpayer is subject to AMT and credits are greater than or equal to federal tax liability before credits. Since in that situation, increasing federal tax liability before credits can reduce overall tax liability, it can become optimal to reduce rather than increase itemized deductions. A similar situation can occur in a state tax that operates a minimum tax tied to the federal minimum tax. If federal tax liability is zero and itemized deductions are very large relative to AGI, then it is possible for an increase in itemized deductions to increase state tax liability without reducing federal tax liability. So once again, tax liability is not a strictly decreasing function of itemized deductions. When calculating marginal tax rates, the calculator currently deals with these situations as follows. If adding an increment to deductions would cause combined federal-state tax liability to increase, the taxpayer is assumed to voluntarily forgo the incremental increase in deduction. An alternative approach that would generally produce the same marginal tax rate, but would arguably produce a more precise estimate of tax liability, would be to solve for the optimal value of itemized deductions, and then always restrict itemized deductions to be less than that amount. The calculator currently does not attempt to solve this particular, extremely complicated, optimization problem that only applies to an extremely small number of taxpayers. It is not even clear whether this alternative approach would be better, since it is evident from tax return data that taxpayers who are in this situation often report itemized deductions that are larger than optimal.

Further details on selection of itemization status

There are some situations where simply choosing the larger of itemized deductions or the standard deduction will not minimize combined federal and state tax liability. Being on the federal alternative minimum tax is one such situation. This can also be a problem when state itemization status is constrained in some way by federal itemization status (information on these constraints is contained in the **itemiz** variable described in part XIII below), or when there is a state AMT that is a percentage of the federal AMT (see **mintaxtype** = 5 below). To take one example, there are some states where state itemization status must be identical to federal itemization status, and where the state itemized deduction is equal to the federal itemized deduction less state income taxes. In that situation, there will be some taxpayers for whom federal itemized deductions exceed the federal standard deduction, but for whom state itemized deductions are smaller than the state standard deduction. Thus, choosing to itemize at the federal level can force the taxpayer to take a sub-optimal itemization status at the state level. The cost of constraining state itemization might make it optimal to choose a federal itemization status that does not minimize federal taxes alone.

These complications are addressed in the tax calculator by choosing the combination of federal and state itemization statuses that minimizes combined federal-state tax liability, taking into account any constraints federal itemization imposes on state itemization. First, federal tax liability is computed twice, once for each federal itemization status, and the itemization status that minimizes combined federal and state tax liability is chosen.

Next, if the taxpayer lives in a state where state itemization is constrained in some way by federal itemization status, or lives in a state where the state AMT is a percentage of federal AMT, state tax liability is also computed twice, once for each federal itemization status. (In other states, choosing the itemization status that minimizes state tax liability is all that is necessary to minimize combined federal-state liability, so the program does that.) The state tax liabilities computed under each of the federal itemization statuses are then fed back into the next iteration of the federal tax calculator in order to help determine the federal itemization status that minimizes combined federal-state liability. The program goes through four iterations of the federal and state calculators. The four iterations are then repeated after adding an increment to a variable to compute marginal tax rates, but in this set of iterations, itemization status is constrained to be the same as it was in the corresponding iteration from before the marginal tax rate increment was added.

V. TESTING

The *IncTaxCalc* tax calculator has undergone several forms of checking and testing so far.

1) Federal and state tax law parameters in the IncTaxState.dat and IncTaxFed.dat files were initially entered and documented by research assistants, and then comprehensively checked and edited by another set of research assistants. All of the data was then checked against the original sources, over several months of full time work, by the author. All data for tax year 2003 and later is entered independently by two different research assistants and then checked by the author (discrepancies between the two RA's data sets in the value of a variable suggests areas in need of particularly careful checking).

2) As second approach was to test the calculator on sample data constructed from the Statistics of Income individual income tax return cross-sectional file from a variety of years. This procedure often involved taking data from a year when an SOI file was available, adjusting the data for inflation, and then using it to test the calculator for a different year. Tests were run in this manner for all years covered by the calculator. The log files and estimates were then checked carefully for any errors or anomalies. Odd marginal or average tax rates often serve as a particularly good indicator that something is wrong. Any instances of such anomalies were investigated, and any errors leading to these anomalies were fixed.

3) A third form of testing involved comparing federal tax liability estimates with actual values from individual income tax return data. For example, I used the March 2007 version of the tax calculator to compute taxes for all returns in the 1979-90 University of Michigan public use income tax return panel (excluding married filing separately and dependent returns). The correlation between computed and actual "tax generated" (**fdtxliab_bc** in my calculator, or **FtaxNORM** in 1987) was 0.99972. The correlation between computed and actual final federal tax liability was 0.99797. A perfect match would be impossible because the public use data blurs or omits some

variables to protect confidentiality. Brad Heim at the Treasury department has also done extensive testing of the March 2007 version of the tax calculator using Treasury panel data on individual income tax return data for years between 1979 and 2005. He generally finds correlations between computed and actual federal tax liability in excess of 0.99.

4) A fourth form of testing is to compare estimates with those from the NBER Internet *Taxsim* model. I tested the January 2007 version of *IncTaxCalc* against version 8.0 of Internet *Taxsim* for the years 1979 through 2004 in the following manner. A test data set was derived from the 1985 IRS public use cross sectional data of individual income tax returns. A random sub-sample of about 10% of the returns was taken for each year 1979-2004, taxpayers were randomly assigned to states, and all values of dollar denominated variables were adjusted for inflation between 1985 and the appropriate year. Variables for *IncTaxCalc* that have no analogues in Internet *Taxsim* (including **miscdedlim**, **charcg**, **fdcred**, **otaxpref**, **oamtadj,** and **avglaginc**) were set to zero. Other *IncTaxCalc* variables were combined together where necessary to create the 22 variables in the Internet *Taxsim* input file. Marginal tax rates were computed with respect to an increment to the primary earner's wage and salary income.

   When this test was conducted, the following correlations were found between tax liabilities and marginal tax rates calculated by *IncTaxCalc* and *Taxsim*.

   - Federal tax liability (**taxf**): 0.99420
   - State tax liability (**taxs**): 0.97649
   - Federal marginal tax rate (**mtrf**): 0.96426
   - State marginal tax rate (**mtrf**): 0.94574

   Because of the different methodologies, assumptions, and approximations used by the two calculators (described above), we should not expect perfect correlations. These correlations suggest that they still produce reasonably similar results, though.

VI. INPUT DATA SET WITH USER-SUPPLIED TAXPAYER INFORMATION

The input data set supplied by the user contains information specific to individual taxpayers. Each row or record represents a taxpayer, and each column or variable represents a taxpayer characteristic such as year, income, age, etc. There are 68 required variables, specified below. If you do not have any information on some of the variables in your data, zero is always an acceptable value (missing values are not acceptable for any variable). Some items that generally receive similar treatment by the law (for example, many itemized deductions) can be combined together in a single variable with minimal loss of accuracy. In the case of a text file, the variables must be in order from left to right, while in a SAS data set they just need to be associated with the appropriate variable names. The only variables that may take negative values are **businc1**, **businc2**, **farminc1**, **farminc2**, **othcg1**, **othcg2**, **rentinc1**, **rentinc2**, **partscorp1**, **partscorp2**, **othinc1**, and **othinc2.** In those cases negative values should be limited to the maximum deductible amount (taking into account things like passive loss restrictions, limitations on capital loss deductions, etc.), as these limitations on losses are not computed endogenously by the program. In the variable list below, bold indicates the variable name, and italics indicate possible values for the variable.

ID, YEAR, STATE

id Numeric case identification number.

year Four-digit calendar year when income was actually earned by taxpayer.

fedyear Four-digit calendar year for applicable federal law.
Note that starting in 1981, adding 0.1 to **fedyear** will cause the calculator to use the federal tax law that would have applied in that year if the most recent major federal tax reform had not been enacted. So for example, if **fedyear** = 1987.1, the calculator uses the federal tax law that would have applied in 1987 if the Tax Reform Act of 1986 had not been enacted. Federal tax reforms enacted in 1981, 1982 (changes to minimum tax and AMT), 1983 (social security), 1986, 1990, 1993, 1997, 2001, and 2003 are counted as major federal tax reforms. In general, this is only done for the first year after the tax reform is enacted. Check the federal tax parameter spreadsheet (IncTaxFed.xls) for details on when this is available.

stateyear Four-digit calendar year for applicable state law.

fedyear and **stateyear** are specified separately from **year** because the user may want to calculate, for example, future or past tax rates for a given taxpayer, and might want to use different years for federal and state (for example, because current law becomes fully phased-in in different years at the federal and state levels). Tax law for a particular calendar year represents the tax law applying to income received in that year. Because state tax law has only been entered through 2007 so far, if **stateyear** is set

to be larger than 2007, the calculator will not calculate a state income tax liability.

state Code for state of residence (postal or SOI).
This can be the two-letter postal abbreviation for state of residence, lower case. In that case, abbreviations for all 50 states and *dc* are all valid entries, and the code for unknown state is *zz.* Alternatively, **statecode** can be the IRS Statistics of Income two-digit code number for each state, with zero serving as the missing value. The user must specify which type of state code is being used via the *statecodetype* parameter in the *IncTaxCalc* macro (see section II above).

DEMOGRAPHIC INFORMATION

filertype Marital / filing status.
s -- single
m -- married (calculator determines separate or joint filing depending on which is advantageous).
h -- head of household

deps Number of dependent exemptions (not including taxpayer or spouse).

kids1 Number of dependents eligible for federal child care credit or deduction.
Age limitations:
1954-1963: <12
1964-1971: <13
1972-1988: <15
1989-present: <13

kids2 Number of dependents eligible for federal earned income credit.
Age limitations:
1975-84: <19 or full-time student
1985-90: no age limit but must be dependent child
1991-present: <19 or full-time student < 24
Note: supplemental credit for child <1 which applied from 1991-93 is not currently incorporated in the calculator.

kids3 Number of dependents eligible for federal child credit.
Age limitation, 1998-present: <17.

agenum Number of age exemptions / deductions.
0 -- None
1 -- Either primary taxpayer or spouse is aged 65 or over, but not both.
2 -- Both primary taxpayer and spouse are >= 65

age Age of primary taxpayer (0 if missing).
Used to compute eligibility for certain state tax preferences for the elderly, where eligibility age may differ from 65. If age is not available, agenum will be used to determine eligibility.

agesp Age of spouse (0 if missing). See age.

blind Are taxpayer or spouse blind? Enter 0 for no, 1 if one of taxpayer or spouse is blind, 2 if both taxpayer and spouse are blind. Note that this is only used to calculate federal exemptions (1948-1987) and the federal standard deduction (1987 to present). We have not collected data on state tax treatment regarding blindness.

INCOME AND ITS COMPONENTS

income Broad measure of income.
The calculator uses this variable for only two purposes: (1) it serves as a denominator for calculating an average tax rate, and (2) it is used to calculate eligibility for certain state low-income credits where eiligibility depends on a broader definition of income than AGI (e.g., the measure of income may include welfare benefits, etc.). Other than (2), this variable plays no role in the calculation of tax liabilities or rates; the measure of income used to calculate tax liability is built up from its individual components below.

wagsal1 Wage and salary income, primary earner

wagsal2 Wage and salary income, spouse

businc1 Sole proprietorship (Schedule C) net income or loss, primary earner

businc2 Sole proprietorship (Schedule C) net income or loss, spouse

farminc1 Farm net income or loss (Schedule F), primary earner

farminc2 Farm net income or loss (Schedule F), spouse

ltcg1 Long-term capital gain, primary earner.
Include here the value of long-term capital gains that may be subject to preferential treatment (exclusions, lower rates, etc.). Include the full amount of gain, not just the part included in AGI. When tax treatment for gains depends on holding period, the calculator assumes that the treatment accorded to gains with the longest holding period specified in the law applies to these gains. Include only positive values here.

ltcg2 Long-term capital gain, spouse.

othcg1 Other capital gain or deductible loss, primary earner.
Include here any capital gains not subject to preferential tratment, or deductible losses. Only include the deductible portion of any loss.

othcg2 Other capital gain or deductible loss, spouse.

div1 Dividend income, primary earner.

div2 Dividend income, spouse.

int1 Interest income, primary earner.

int2 Interest income, spouse.

teint1 Federally tax-exempt interest income (on state and local bonds), primary earner. The calculator only uses this in computations of EITC and taxability of social security benefits. It is only available in tax return data starting in 1987.

teint2 Federally tax-exempt interest income, spouse.

pension1 Federally taxable pension income, primary earner.

pension2 Federally taxable pension income, spouse.

rentinc1 Net rental income or loss, primary earner (may be negative).

rentinc2 Net rental income or loss, spouse.

ui1 Unemployment compensation, primary earner.
Include gross amount; calculator determines the portion that is includable in AGI under federal law.

ui2 Unemployment compensation, spouse.

ssben1 Gross social security benefits, primary earner.
Note: even before social security benefits became taxable at the federal level in 1984, social security benefits can still play a role in state tax calculations in a small number of cases. A few states had retirement income exclusions or credits that depended in part on the value of social security benefits, and a tiny number of states taxed social security benefits even before 1984.

ssben2 Gross social security benefits, spouse.

partscorp1 Partnership and S-corporation income, primary earner.
Note: currently, this variable is used mainly in order to calculate tax liability in New Hampshire and Tennessee, where the tax was limited to interest and dividends (where dividends include distributions of profits from S-corporations and partnerships). The calculator does not yet capture any other differences between federal and state treatment of partnership and/or S-corporation income.

partscorp2 Partnership and S-corporation income, spouse.

othinc1 Other income or loss, primary earner.
Include here any other income or loss in total (gross) income for federal tax purposes. Do not include state income tax refunds, since state income taxes are computed endogenously.

othinc2 Other income or loss, spouse.

ADJUSTMENTS AND DEDUCTIONS

Note that the limitation of itemized deductions for people with AGI above certain thresholds (applicable at the federal level and in most states since 1991) is computed endogenously by the calculator. So in the variables below, report the gross value of itemized deductions before the limitation is applied. Also, in years when there is a zero bracket amount instead of a standard deduction (1977-86 at the federal level), report the full value of itemized deductions, not just the amount above the ZBA.

othadj1 Other federal adjustments to income, primary earner.
This should include adjustments to income that are subtracted from gross income to get AGI on the federal return, except for the following: the two-earner couple deduction applying in 1982-86; moving expenses; unreimbursed employee business expenses; and one-half of social security taxes on self-employment income. The specific adjustments just mentioned are calculated endogenously based on other information available in the input data set. What's left in this variable are things like IRA contributions and the student loan interest deduction. The items in **othadj1** and **othadj2** are taken as given, not computed endogenously. States for which the variable **othadjsaf** is equal to 1 (see below) are assumed to have the same values for **othadj1** and **othadj2** as on the federal return, which is usually but not always accurate.

othadj2 Other federal adjustments to income, spouse.

charity Charitable donations.

charcg Unrealized capital gains on donations of appreciated property.

This is included because the AMT at one time taxed these gains (from 1987-90 for tangible property, and from 1987-92 for intangible property), and because it may be useful for calculating marginal tax rates in studies of charitable giving. It is not generally available in any data set, but tax data does usually include information on the total value of non-cash contributions, which may be used to construct an imputed value. If the marginal tax rate is calculated with respect to **charcg**, it is done so holding overall charity constant (so it essentially just returns the AMT marginal rate, or zero if AMT is not applicable).

intpaid Interest paid, other than investment interest.
Only include interest that is deductible at the federal level – for instance, do not include consumer interest when it is not deductible, and include only the deductible portion in the years when its deductibility is being phased-out.

invint Investment interest paid.
This is separated from other interest for purposes of calculating federal limitation on itemized deductions since 1991.

stinctax State income taxes paid (ignored if state is known)
If state is known, the calculator ignores this variable and computes state income taxes endogenously. In that case, **stinctax** can be set to zero or any other number, and it won't affect anything (it cannot be set to missing, though – missing values are not allowed for any variable in the input data set). If state is set to the "unknown" value (*zz* or 0), then the calculator will include **stinctax** in federal itemized deductions, but will treat them as given, so that state income tax can affect federal tax liability, but not marginal tax rate. It is included because some data sets (e.g., public-use tax data) report state income tax deductions, but omit state of residence for some or all records.

proptax State and local property taxes paid.

salestax State and local sales taxes paid.

taxnodetail Total deductible state and local taxes, when detail by tax is unavailable.
Set this variable equal to zero if information on the particular taxes listed above is available. This variable is used in situations where the data set only provides information on the total state and local taxes paid deduction, with no detail by type of tax. In those cases, the calculator will construct an estimated deduction for non-income taxes called **tax_nonincome,** which will be set equal to **taxnodetail**, minus endogenously computed state income taxes. If **taxnodetail** is nonzero, the calculator will perform some extra iterations. Three iterations are run to determine the value of **tax_nonincome**, then then **tax_nonincome** is held constant for three more

iterations as the calculator computes the effects of cross-deductibility of state and federal taxes, etc. When the calculator is re-run to compute marginal rates, the value of **tax_nonincome** is held constant at its value in the corresponding iteration of the first run. Caution: if **taxnodetail** > 0, **mtrfns**, **mtrsi**, **atrsi**, **taxfns**, and **taxsi** (described below) will not be computed correctly. All other output variables will be fine, however. Also note that if taxnodetail > 0, make sure to set **proptax**, **salestax** and **stinctax** to zero, otherwise there will be double-counting in the computation of deductions.

medexp Medical and dental expenses.
Include the full amount of such expenses. The calculator endogenously applies the percentage of AGI floor in the federal personal income tax. States that allow medical expense deductions are assumed to follow federal provisions, which is almost always the case now but was not always so several decades ago.

casualty Casualty and theft losses
Include the full amount of losses here. The calculator applies any percentage of AGI floors endogenously.

movex Deductible moving expenses.
Calculator treats this as either an itemized deduction or as an adjustment, depending on the federal law for that year.

busex Unreimbursed employee business expenses.
Calculator treats this as either an itemized deduction or as an adjustment, depending on the federal law for that year. Include full amount; calculator will incorporate 2% of AGI floor for 1987 and later.

miscdedlim Miscellaneous itemized deductions subject to 2% of AGI floor (instituted beginning 1987). Include full amount (other than unreimbursed employee business expenses). Calculator endogenously applies the 2% of AGI floor when applicable.

omiscded Other miscellaneous itemized deductions.

CREDITS

childcare Expenses for child care.
This is used to compute the federal credit for child care expenses (starting in 1976), or the itemized deduction for the same (1954-1975), as well as relevant state provisions.

fdcred Federal credits other than EITC, child credit, child care credit, and elderly

credit. EITC, child credit, child care credit and credit for elderly (i.e., retirement income credit) are computed endogenously by the tax calculator; other federal credits are included in this **fdcred** variable and are taken as given. Note that the calculator does not accurately capture the interaction between the foreign tax credit and the alternative minimum tax. This is unavoidable, because a correct specification of the interaction would require more information than is generally available even in income tax return data. For some applications, removing the value of the foreign tax credit from **fdcred** may be appropriate.If the goal of calculating tax liability is to compute the effect of income taxes on the individual's disposable income, then ignoring the foreign tax credit yields results that are closer to the conceptually preferred combined domestic and foreign tax liability anyway.

INFORMATION FOR MINIMUM AND MAXIMUM TAXES

otaxpref Other tax preferences in base of federal minimum tax or AMT.
Include here the value of any tax preference items that are added back into the base of minimum tax (1970-82) or the alternative minimum tax (1983-present), aside from capital gains exclusions, dividends exclusions, itemized deductions, standard deductions, and personal exemptions, which are computed endogenously based on other information already provided above.

oamtadj Other AMT adjustments.
Include here the value of any AMT "adjustments" that are added back into the base of the AMT (1987-present), aside from itemized deductions, standard deductions, personal exemptions, and capital gains on charitable donations of appreciated property, and anything that is included in **otaxpref**, all of which are computed endogenously based on other information already provided above. These adjustments are separated out from **otaxpref** because tax return data contains information on both, and they are each treated differently by some state minimum taxes (e.g., NY). This variable is ignored prior to 1987. One exception to the above: if **fedyear** = 1981, then if **oamtadj** is non-zero, the calculator will assume that **oamtadj** contains information about the amount of **ltcg** that was realized after June 9, 1981, and is therefore subject to the maximum tax rate of 20%. If **oamtadj** is greater than zero in 1981, the calculator assumes that **oamtadj** are gains that were realized after June 9, 1981 and thus are subject to the alternative 20% capital gains rate calculation. If **oamtadj** = -1 in 1981, the calculator assumes all of **ltcg** was realized before June 9, 1981. If **oamtadj** = 0 in 1981, then the calculator will assume that all of **ltcg** was realized after June 9, 1981. In all cases, the **ltcg** variables should include all capital gains, regardless of when in the

year they were realized. In all cases, the calculator assumes that any marginal addition to **ltcg** in 1981 occurs after June 9, 1981.

avglaginc Average lagged taxable income for income averaging computations. This variable is not relevant before 1964 nor after 1986 – enter zero for those years (if you enter some other number for those years, it will be ignored anyway). From 1984 to 1986, this variable should be the average of taxable income for the 3 preceding years. From 1964 to 1983, use the average from the 4 preceding years. If zero is entered for this variable, income averaging is ignored in the tax computations.

psincome Personal service income, used to compute the federal maximum tax on personal service income (1971-1981, also known as the maximum tax on earned income). If set to -1, this variable will be ignored and an estimate will be constructed from other variables in the input data set. This variable is not relevant for years outside of the 1971-1981 range, and can safely be set to zero in those years.

psded Deductions allowable against personal service income, used to compute the federal maximum tax on personal service income (1971-1981, also known as the maximum tax on earned income). This included items such as business expenses and moving expenses allocable to personal service income, contributions to IRA and Keogh plans, and some net operating losses. This variable is generally available in the SOI input files in the relevant years. If set to -1, this variable will be ignored and an estimate will be constructed from other variables available in the input data set (namely business expenses and moving expenses). For years outside of the 1971-1981 range, this variable is not relevant and is ignored by the calculator, so it can safely be set to zero in those years.

INFORMATION FOR CALCULATING CIRCUIT BREAKER CREDITS

The following two variables are used to calculate state "circuit breaker" credits for property taxes and rent. Home value is only rarely used to compute these credits, but rent payments are quite frequently a factor. If set to zero, the calculator will treat them as if they are really zero in the calculations. Note that the circuit breaker credit calculations can be supressed by setting the **cbinclude** macro parameter to zero).

rentpay Annual rent payment (minus any government rent subsidies).

homeval Value of home.

VII. OUTPUT DATA SET

The basic output data set contains the calculated tax liabilities and average and marginal tax rates for each taxpayer. Users can choose whether to produce a space-delimited text file or a temporary or permanent SAS dataset by setting the "outputformat" parameter in the *IncTaxCalc* macro appropriately (see above). The basic output file contains the variables listed below, in order. In the variable descriptions below, "incremental" means the difference between the combined federal and state income tax liability or rate, and what the federal tax liability or rate would be if there were no state income tax. "Bracket rate" means the marginal tax rate on taxable income in the taxpayer's tax bracket under the normal tax calculation. Average tax rates are calculated as tax liability divided by the **income** variable supplied by the user in the input data set (if income is zero or negative, average tax rates are set to zero). All marginal rates (including social security marginal rate) are calculated with respect to a change in the component of income or deductions specified by the user. In the case of income, the marginal rate represents the increase in tax liability caused by adding a user-specified increment to that component of income, divided by the increment. In the case of a deduction, it represents the *decrease* in tax liability caused by adding a user-specified increment to that deduction, where both the decrease and the increment are expressed as positive numbers (in other words, the marginal rate is still reported as positive, even though it represents a reduction in tax liability). In the case of a charitable contribution of appreciated property, the marginal tax rate is just based on any increase in alternative minimum tax liability. Social security tax liability and rates include both employer and employee portions (or the full amount of the social security tax on self-employment income where applicable), and include both the OASDI and HI portions of the tax.

TAXPAYER IDENTIFYING INFORMATION

id Numeric case id

statename State of residence, lower case two-letter postal abbreviation

soi Statistics of income state code

year Year income was earned

stateyear Year of applicable state tax law (see next section for explanation)

fedyear Year of applicable federal tax law (see next section for explanation)

TAX LIABILITIES

tax Combined federal and state income tax liability

taxf Federal income tax liability

taxs State income tax liability

taxsi Incremental state income tax liability. That is, combined federal and state income tax liability (**tax**), minus what federal tax liability would be if there were no state income tax (**taxfns**, defined below). Warning: **taxsi** is not computed correctly if **taxnodetail**>0 (see discussion of **mtrfns** below).

sstax Federal social security tax liability. This includes both OASDI and HI payroll taxes, and it includes both the employee and employer portions of the tax, as well as any self-employment OASDHI taxes. The self-employment portion of the tax can be recovered from the detailed output data set variables **FsstxliabSE1** and **FsstxliabSE1**. The employee portion can be recovered by subtracting self-employment liability from **sstax**, and then dividing by 2.

MARGINAL TAX RATES

mtr Combined federal and state marginal income tax rate. That is, increase in combined federal and state income tax liability caused by adding an increment to the variable specified in **mtrvar**, divided by the size of the increment.

mtrf Federal marginal income tax rate. That is, increase in federal income tax liability caused by adding an increment to the variable specified in **mtrvar**, divided by the increment.

mtrfns Federal marginal income tax rate (**mtrf**) that would apply if there were no state income tax. [Warning: if the input data set on taxpayer characteristics does not break out state tax liability into its component parts (income tax, property tax, and sales tax), but rather combines them all into the **taxnodetail** variable, then **mtrfns** is not computed correctly. In that case, **mtrfns** is computed holding state tax liability constant at the value specified in **taxnodetail**, but the presence of state income tax can affect **mtrfns** by moving the taxpayer across federal tax brackets, to the extent state income tax is included in **taxnodetail**.]

mtrfb Federal marginal income tax bracket rate. That is, the statutory marginal tax rate applying to the taxpayer's ordinary federal taxable income, from the federal tax tables, not including the effects of any phase-outs, credits, alternative taxes, minimum or maximum taxes, special capital gains tax computations, victory tax, defense tax, deductibility of federal income tax from state taxable income, etc. For 1913-1945 and 1969-1970, **mtrfb** includes both the effects of normal tax and surtax.

mtrfbsp Federal marginal income tax bracket rate on spouse (equals **mtrfb** if no spouse, or if spouses file jointly)

mtrs State marginal income tax rate. That is, increase in state income tax liability caused by adding an increment to the variable specified in **mtrvar**, divided by the increment.

mtrsb State marginal income tax bracket rate. That is, That is, the statutory marginal tax rate applying to the taxpayer's ordinary state taxable income, from the state tax tables, not including the effects of any phase-outs, credits, alternative taxes, minimum or maximum taxes, special capital gains tax computations, deductibility of state tax from the federal taxable income, etc.

mtrsbsp State marginal income tax bracket rate on spouse (equals **mtrsb** if no spouse)

mtrsi Incremental state marginal tax rate. That is, the combined federal and state marginal tax rate (**mtr**), less what the federal marginal tax rate would be if there were no state income tax (**mtrfns**). Caution: because of complicated interactions between federal and state taxes, **mtrsi** can sometimes be quite large for completely legitimate reasons. For example, if the marginal tax rate is being calculated with respect to a component of itemized deductions such as charitable giving, and the presence of a state income tax causes the taxpayer to switch from non-itemizing to itemizing, **mtrsi** could equal the combined federal and state marginal tax rates. Large negative values for **mtrsi** can occur whenever adding the federal deduction for state income taxes moves the taxpayer across federal tax brackets, or when it moves the taxpayer from federally taxable to federally nontaxable status. For example, in many years there was an alternative capital gains tax computation in the federal income tax, where tax liability equaled income tax on taxable income excluding capital gains, plus a low tax rate times the amount of capital gains. In that case, a large federal deduction for state income taxes would frequently push the taxpayer from a high marginal federal tax rate to a low marginal federal tax rate on income other than capital gains. Large negative values of **mtrsi** are also common when the value of "other federal credits" (**fdcred**) is large. When **fdcred** is large, a small change in taxable income, such as that caused by the addition of a deduction for state income tax, can rapidly shift the taxpayer from having a high marginal tax rate to having a marginal tax rate of zero (which occurs at the threshold where tax liability before the credit drops below the value of the credit). [Warning: **mtrsi** is not computed correctly if **taxnodetail**>0; see discussion of **mtrfns** above.]

ssmtr Federal marginal social security tax rate. Includes both employer and

employee portions of the tax, self-employment payroll taxes, as well as any payroll tax for Medicare.

AVERAGE TAX RATES

atr Combined federal state average tax rate. Computed as combined federal and state income tax liability (**tax**), divided by **income**. This is set to zero if **income** is zero or negative.

atrf Federal average tax rate. Computed as federal income tax liability (**taxf**) divided by **income**. This is set to zero if **income** is zero or negative.

atrs State average tax rate. Computed as state income tax liability (**taxs**) divided by **income**. This is set to zero if **income** is zero or negative.

atrsi Incremental state average tax rate. Computed as combined federal and state average tax rate (**atr**) minus what the federal average tax rate would be if there were no state income tax. [Warning: **atrsi** is not computed correctly if **taxnodetail**>0; see discussion of **mtrfns** above].

ssatr Federal social security average tax rate. Includes both employer and employee portions of the tax, self-employment payroll taxes, as well as any payroll taxes for Medicare.

OPTIONAL DETAIL VARIABLES

Alternatively, the user can choose to produce a detailed output data set containing the following variables, which provide details on how taxes were calculated, can be produced at the option of the user (this is specified at the end of the program). There will be two versions of each of these variables reported – one version has a "_1" suffix, indicating it is the value for the first iteration (before adding an increment to calculate marginal tax rates). The second version has a "_2" suffix indicating it is the value for the second iteration (after adding the increment). In addition to these, the detailed output data set also includes the values of the input variables, and the values of the variables from the basic output data set listed above.

A note on separate filing: for some variables, the detailed output provides information on the value of the variable for each spouse if the couple were to file separately. The values of these variables are set to zero for unmarried taxpayers or in states or federal years when separate filing is generally disadvantageous (so that the calculator always assumes joint filing). In cases where filing separately minimizes tax burden, the value of a variable for the return as a whole will be equal to the sum of the values for each spouse. In cases where filing jointly minimizes tax burden, that will not necessarily be the case.

increment Dollar value of increment used to calculate marginal tax rates

iteration This equals 2 if marginal tax rates were calculated by adding an increment, and equals 3 if the program calculated them once based on adding an increment and once based on subtracting an increment, and reported the results for the version with the smaller marginal rate in absolute value.

taxf Total federal income tax liability

taxfns Total federal income tax liability if there were no state income tax. [Warning: not computed correctly if **taxnodetail** > 0; see discussion of **mtrfns** above.]

taxs Total state income tax liability

taxsFDED Value of state tax income tax liability used to compute federal itemized deductions. This may differ slightly from **taxs** because in some cases it was calculated one iteration earlier, but in that case the difference should be small. Note that it may also differ from **taxs** because **taxsFDED** represents the state tax liability that

	would apply if the taxpayer were to itemize on the federal return, which may have implications for state tax liability, whereas **taxs** is computed using the optimal state itemization status given any constraints that may be imposed by federal itemization status.
Fagi	Federal AGI
Fssagi	Social security benefits included in federal AGI
Fti	Federal taxable income
Fti1	Federal taxable income of primary taxpayer couple were to file separately. Always set to zero if not married, and in all years from 1948 on.
Fti2	Federal taxable income of spouse if couple were to file separately. Always set to zero if not married, and in all years from 1948 on.
Fsepfiler	Indicator for married filing separately status for federal return (always zero if not married and from 1948 on).
Fexempt	Value of federal personal exemptions
Fstded	Value of federal standard deduction
Fitemded	Value of federal itemized deductions before limitation
Fitemizer	Indicator for federal itemization status (1=itemizer, 0=not itemizer)
Fitemlost	Federal itemized deductions lost to limitation
Fidmaxlim	Indicator for maximum itemized deduction limitation. That is, **Fidmaxlim** equals 1 if **Fitemlost** is equal to 80% of unprotected itemized deductions (the 80% is gradually reduced over the phase-out period).
FtaxNORM	Federal tax liability, "normal" calculation (before other provisions listed below, which are applied sequentially). This is generally the initial tax liability computation arrived at by applying the tax rates and brackets to taxable income.
FtaxMAXEI	Federal income tax liability after applying maximum tax on earned income

FtaxALTCG	Federal income tax liability after applying any alternative capital gains computation.
FtaxINCAVG	Federal income tax liability after applying income averaging.
FmtrMEI	Federal marginal tax rate after applying maximum tax on earned income.
Fdtxliab_bc	Federal income tax liability after above provisions, but before credits and minimum taxes.
FtaxMIN	Federal minimum tax liability.
Famt	Federal alternative minimum tax liability.
Famtpref	Federal AMT preferences.
Famti	Federal alternative minimum taxable income (calculated before AMT exmeptions).
Famtexempt	Allowable federal AMT exemption.
Famtiae	**Famti** less allowable AMT exemption.
FamtiaeEXCG	**Famtiae** minus capital gains and/or dividends subject to special computation.
Ftamt	Tentative federal AMT (AMT before subtracting income tax liability).
Famt	Increase in total tax liability caused by federal AMT (i.e., **Ftamt** minus federal tax liability computed before the AMT).
Fkcarecred	Gross federal credit for child care expenses. (Some of this may not be usable due to non-refundability).
Feic	Federal earned income credit.
Fkidcred	Usable federal child credit, non-refundable portion.
Fkidcredref	Usable federal child credit, refundable portion.
Feldcred	Federal credit for elderly
Fsstxliab	Federal social security and Medicare payroll tax liability (including

	self-employment tax, and including both employer and employee portions). Same as **sstax** in the basic output data set.
FsstxliabSE1	Federal social security and medicare self-employment tax, primary earner.
FsstxliabSE2	Federal social security and medicare self-employment tax, spouse.
agi	State adjusted gross income.
agi1	State adjusted gross income, primary taxpayer if couple were to file separately.
agi2	State adjusted gross income, spouse if couple were to file separately.
Sti	State taxable income.
Sti1	State taxable income, primary taxpayer, if couple were to file separately.
Sti2	State taxable income, spouse, if couple were to file separately.
Ssepfiler	Indicator for married filing separately status for state return.
exempt	Value of state personal exemptions.
exempt1	Value of state personal exemptions for primary taxpayer if couple were to file separately.
exempt2	Value of state personal exemptions for spouse if couple were to file separately.
stded	Value of state standard deduction (combined value for spouses if filing separately).
itemded	Value of state itemized deductions. (Note that in a few cases, in states that do not have itemized deductions, this variable will include other kinds of deductions, for example the social security tax deduction in Massachusetts, an extra exemption amount that could be taken in lieu of a credit in Ohio, or property tax deductions in New Jersey and Indiana).
itemded1	Value of state itemized deductions for primary taxpayer if couple were to file separately.

itemded2	Value of state itemized deductions for spouse if couple were to file separately.
itemizer_s	Indicator for state itemization status.
retexamt	State retirement income exclusion.
lowexamt	State low-income exemption.
miscex	State miscellaneous exemption.
StaxNORM	State income tax liability, "normal" calculation, before other provisions below. This is generally the initial tax liability determined by applying standard rates and brackets to taxable income.
sptxliab	State "special" tax liability, 1st special tax.
sptxliab2	State "special" tax liability, 2nd special tax.
StaxALTCG	State tax liability after alternative capital gains computation.
StaxASP	State tax liability after special tax and alternative capital gains tax computations.
StaxAMIN	State tax liability after minimum tax. Note that minimum tax may be incorporated at different points in the tax calculation in different states, depending on the value of **mintaxapp**. If mintaxapp=4 or 5, the minimum tax is not reflected in **StaxAMIN**, but rather first appears in **StaxAX**.
StaxAMIN1	**StaxAMIN** for primary taxpayer if couple were to file separately.
StaxAMIN2	**StaxAMIN** for spouse if couple were to file separately.
StaxMIN	State minimum tax liability (amount added to tax liability).
gencred	Value of general state tax credits.
gencred1	Value of **gencred** for primary taxpayer if couple were to file separately.
gencred2	Value of **gencred** for spouse if couple were to file separately.
retcred	Value of state retirement credit.

retcredref	Value of refundable state retirement credit.
lowcred	Value of state low-income credit.
lowcredref	Value of refundable state low-income credit.
marcred	Credit for joint filers to reduce marriage penalty.
kcarecred	Value of state child care credit.
kcarecred1	Value of **kcarecred** for primary taxpayer if couple were to file separately.
kcarecred2	Value of **kcarecred** for spouse if couple were to file separately.
StaxAGC	State tax liability after all credits except EITC and circuit breakers, but before any "extra" taxes.
StaxAGC1	StaxAGC for primary taxpayer if couple were to file separately.
StaxAGC2	StaxAGC for spouse if couple were to file separately.
xtaxs	"Extra" state tax liability.
xcredit	"Extra" state tax credit.
xcredit1	Value of **xcredit** for primary taxpayer if couple were to file separately.
xcredit2	Value of **xcredit** for spouse if couple were to file separately.
StaxAX	State tax liability after extra taxes and credits except EITC and circuit breakers.
StaxAX1	StaxAX for primary taxpayer if couple were to file separately.
StaxAX2	StaxAX for spouse if couple were to file separately.
eicstateref	Refundable portion of state earned income credit.
eicstatenoref	Non-refundable portion of state earned income credit.
propcred	State circuit breaker credit for property taxes or rent.

localtax Local income tax liability.

Ftaxtype Type of federal tax (see description of federal parameters below).

taxtype Type of state tax (see description of state parameters below).

Fchlimbind Is charitable deduction larger than the maximum percentage of AGI allowed at the federal level?
0 = No
1 = Yes

chlimbind Is charitable deduction larger than the maximum percentage of AGI allowed at the state level?
0 = No
1 = Yes, and no carryovers allowed
2 = Yes, and carryovers allowed

VIII. DATA SET WITH STATE TAX LAW PARAMETERS (IncTaxState.dat)

The following is the variable list for IncTaxState.dat. These variables contain the information about how the state personal income tax laws work. Note that each possible state / year / filing status combination from 1900 through 2007 is a separate record. No records are included for state-year combinations where a state personal income tax did not apply.

The coding allows for up to four tax or credit systems to be operated in parallel, which was sometimes necessary for particularly sadistic states. The first set of variables describes the ordinary tax system. Next, up to two "special taxes" (indicated by variables beginning with "sp") may be specified. The "special tax" feature can accomodate fairly simple additional taxes, for example when capital gains are taxed at a different rate than other income. Special taxes can have at most one tax rate and a single exemption. Finally, the "extra tax" provision at the end (indicated by variables beginning with "x") allows for a more complicated additional tax or credit which may have multiple tax brackets, different exclusions, deductions, and exemptions than the ordinary tax, etc. This was useful for coding in the features of optional maximum taxes, certain complicated credits, surtaxes on particular types of income, etc. State tax liability generally equals the sum of the ordinary tax, special taxes, and extra taxes, where credits enter negatively (appropriate adjustments to this are made for maximum and minimum taxes, etc.). In additon to these, there are also separate sets of variables for features such as retirement income exclusions and credits, low income exemptions and credits, and minimum taxes.

Also note that in cases where we coded a state tax as being a percentage of federal income or a function of federal taxable income (see **taxtype** and **base** below) almost all other state variables are set to zero, even though they may apply in the federal tax. In those cases, the necessary information is derived from the federal variables, and most state variables are ignored.

Bold indicates variable name. Italics indicate possible values for the variable.

STATE, YEAR AND FILING STATUS

statename State of residence, lower-case two-letter postal abbreviation.

stateyear Tax year to which state law applies.

filertype Filing status to which this information pertains.
s -- Single
m -- Married
h -- Head of household

soi IRS Statistics of Income division state code (two-digit)

statekey An index variable equal to: **stateyear***1000 + **soi***10 + (1 if head of household, 2 if married, 3 if single). This is used as a SAS "index" for the data set, to facilitate the use of the "table lookup" approach to merging data, using the "key=" feature of the "set" statement.

TYPE OF TAX AND DEFINITION OF TAX BASE

taxtype Type of income tax. Note that if **taxtype** is *fedtab* or some variation of *pctfed*, then all other state variables are ignored, and thus can be set to zero. The exception is that for the *pctfed* type taxes, if any of the variables in section labeled "general credits" below are non-zero, they will not be ignored by the calculator. In addition, **pctfdeldcr** will not be ignored if **taxtype** = *pctfed4*. If **taxtype** is *none* or *cbonly* then all other state variables are ignored and can be set to zero (or *none* in the case of character variables). See also **xtaxtype** = *fedtab2*.

none -- State does not have a personal income tax, or no data is available.

pctinc -- Tax liability is a function some measure of income.

pctfed -- Tax liability is a percentage of federal tax liability after credits.

pctfed2 -- Same as *pctfed*, except that base is federal tax liability re-calculated to disallow deduction for state income taxes.

pctfed3 – Tax liability is a percentage of federal tax liability after credits, but does not allow refundable credits.

pctfed4 – Tax liability is a percentage of federal tax liability before credits (but including minimum tax and alternative minimum tax liability).

cbonly – State does not have a personal income tax, but does have a circuit-breaker property tax credit.

fedtab – Louisiana, 1975-1979. During this period, the Louisiana legislature produced tables that indicated the Louisiana state tax liability that corresponded to each federal tax liability for each filing status and each number of exemptions. The law did not explain the underlying logic that was used to construct the tables. In order to deal with this, for each filing status and number of exemptions, we used data from the tables to estimate a regression where Louisiana tax as a percentage of federal tax was the dependent variable, and the explanatory variables were an intercept and a 4-knot spline in log federal tax liability, where the knots in the spline were chosen by graphing the relationship and selecting the values of the knots at obvious inflection points. The R-squareds for eah

regression were in excess of 0.99. This enabled us to closely approximate the tables with twelve parameters for each filing-status / exemption combination. In the state tax parameter data set, we recorded the parameters needed to approximate the tax in the variables: **b6-b26**, **r6-r26**, **xb1-xb14**, **xr1-xr14**, and the **cb** and **xcb** variables. All other variables are ignored. The code below indicates how each variable is used; **exemptions** is the number of exemptions (including age exemptions); **taxs** is state tax liability, and **taxf_S** is federal tax liability. [The data used to construct these variables are in the spreadsheets LouisianaTaxTables1975-1976.xls and LouisianaTaxTables1977-1982.xls]

Taxtype *=fedtab: Single with 1 exemption, or head of household or married with 2 exemptions*:

```
if taxf_S <= b6 then taxs=0 ;
else taxs = min(taxf_S, b11)*(max(0, r6
+ r7 *log(min(taxf_S, b11))
+  r8 *max(0, log(min(taxf_S, b11))-log( b7 ))
+  r9 *max(0, log(min(taxf_S, b11))-log( b8 ))
+  r10 *max(0, log(min(taxf_S, b11))-log( b9 ))
+  r11 *max(0, log(min( b11 , taxf_S))-log( b10 )))/100)
+ ( r26 / 100)*max(0,taxf_S -  b11 ) ;
```

Taxtype *=fedtab: Single with 2 or more exemptions, or head of household or married with 3 exemptions*.

```
if taxf_S <= b12 then taxs=0 ;
else taxs = min(taxf_S, b17)*(max(0, r12
+ r13 *log(min(taxf_S, b17))
+  r14 *max(0, log(min(taxf_S, b17))-log( b13 ))
+  r15 *max(0, log(min(taxf_S, b17))-log( b14 ))
+  r16 *max(0, log(min(taxf_S, b17))-log( b15 ))
+  r17 *max(0, log(min( b17 , taxf_S))-log( b16 )))/100)
+ ( r26 / 100)*max(0,taxf_S -  b17 ) ;
```

Taxtype *=fedtab: Head of household or married with 4 exemptions*.

```
if taxf_S <= b18 then taxs=0 ;
else taxs = min(taxf_S, b23)*(max(0, r18
+ r19 *log(min(taxf_S, b23))
+  r20 *max(0, log(min(taxf_S, b23))-log( b19 ))
+  r21 *max(0, log(min(taxf_S, b23))-log( b20 ))
+  r22 *max(0, log(min(taxf_S, b23))-log( b21 ))
+  r23 *max(0, log(min( b23 , taxf_S))-log( b22 )))/100)
+ ( r26 / 100)*max(0,taxf_S -  b23 ) ;
```

Taxtype *=fedtab: Head of household or married with 5 exemptions*.

```
if taxf_S <= xb1 then taxs=0 ;
else taxs = min(taxf_S, xb6)*(max(0, xr1
```

```
   + xr2 *log(min(taxf_S, xb6))
   +  xr3*max(0, log(min(taxf_S, xb6))-log( xb2 ))
   +  xr4*max(0, log(min(taxf_S, xb6))-log( xb3 ))
   +  xr5*max(0, log(min(taxf_S, xb6))-log( xb4 ))
   +  xr6*max(0, log(min( xb6 , taxf_S))-log( xb5 )))/100)
   + ( r26 / 100)*max(0,taxf_S -  xb6 ) ;
```

Taxtype *=fedtab: Head of household or married with 6 exemptions*.

```
   if taxf_S <= xb7 then taxs=0 ;
   else taxs = min(taxf_S, xb12)*(max(0, xr7
   + xr8 *log(min(taxf_S, xb12))
   +  xr9*max(0, log(min(taxf_S, xb12))-log( xb8 ))
   +  xr10*max(0, log(min(taxf_S, xb12))-log( xb9 ))
   +  xr11*max(0, log(min(taxf_S, xb12))-log( xb10 ))
   +  xr12*max(0, log(min( xb12 , taxf_S))-log( xb11 )))/100)
   + ( r26 / 100)*max(0,taxf_S -  xb12 ) ;
```

Taxtype *=fedtab: Head of household or married with 7 or more exemptions*.

```
   if taxf_S <= cbthresh1 then taxs=0 ;
   else taxs = min(taxf_S, cbpct1)*(max(0, xcbthresh1
   + xcbthresh2*log(min(taxf_S, cbpct1))
   +  xcbthresh3*max(0, log(min(taxf_S, cbpct1))-log( cbthresh2 ))
   +  xcbthresh4*max(0, log(min(taxf_S, cbpct1))-log( cbthresh3 ))
   +  xcbthresh5*max(0, log(min(taxf_S, cbpct1))-log( cbthresh4 ))
   +  xcbpct1 *max(0, log(min( cbpct1 , taxf_S))-log( cbthresh5 )))/100)
   + ( r26 / 100)*max(0,taxf_S -  cbpct1 ) ;
```

base Starting point for calculating tax base. Possible values:

none – State does not have a personal income tax

gi -- Tax base calculation starts with a measure of gross income, from which various exclusions, adjustments, deductions, and exemptions are then subtracted.

fti -- Tax calculation starts with federal taxable income, except that state income tax is assumed not to be deductible from itself unless **sitded** = 1 (see below). If **base** = *fti* then all state variables having to do with exclusions, adjustments, and deductions except for **sitded** and **itemiz** are ignored and can be set to zero. Some states for which we coded base = *fti* allowed credits, extra exemptions, or provisions coded in the sets of variables listed under **retextype**, **lowtype**, and **miscextype** below, so these variables are not ignored by the program. Any exemptions that are coded in will represent the extra amount on top of the federal exemptions. Note that there were a large number of states that started the tax calculation

process with federal taxable income, but that we coded as starting with gross income and then coded in the appropriate deductions, exemptions, etc. to achieve the same result. Currently the only states coded as **base** = *fti* are Alaska (1964-1979), North Dakota (1991-2000), and Vermont (2001). Also note that the program code for **base** = *fti* is not set up to deal with states where it can be advantageous for married couples to file separately, so those sorts of state should not be coded as **base** = *fti*.

fdtxliab – Tax calculation starts with federal tax liability (see **taxtype** for further information on exactly how).

cg -- Tax base starts with capital gains only.

div -- Tax base starts with dividends only.

di -- Tax base starts with dividends and interest only. Note that in New Hampshire and Tennessee, this also includes partnership and S-corporation income.

dcg -- Tax base starts with dividends and capital gains only.

dcgi -- Tax base starts with dividends, capital gains, and interest only.

othadjsaf Are the adjustments subtracted from gross income to get to adjusted gross income, and treatment of unemployment insurance benefits, generally similar to those in the federal income tax? This is set equal to 1 for all states that define their own taxable income by starting with federal adjusted gross income or federal taxable income, and is also set equal to 1 for any state that generally has similar adjustments to the federal income tax even if not every detail of the treatment of adjustments or unemployment insurance is identical to federal treatment – this is just meant to be a rough approximation. States with **othadjsaf** = 0 are assumed to disallow all adjustments not specified elsewhere in the state income tax parameter variables, and are assumed not to tax unemployment insurance benefits.

0 -- No

1 -- Yes

TREATMENT OF MARRIED COUPLES

See section above on "Joint versus separate filing and division of income and deductions between spouses" for details on how the choice between joint and separate filing for married couples is addressed by the calculator. Filing separately is usually advantageous when **multbrk**=0, **sepdis**=0, and **bracknum**>1.

multbrk Are there multiple sets of brackets for different marital / filing statuses?
0 – no. (There is one set of brackets for all)
1 – yes. (There are different brackets for different filing statuses. Among other states, this includes all community property states, which have always effectively had tax brackets twice as large for married couples as they do for singles. It also includes any state where the brackets for married filing separately are different than those for married filing jointly such that filing separately is generally disadvantageous, as in WV 1987-present for example).

comprop Community property state?
This does not affect the state calculations (the effects of community property state status are already incorporated into the bracket structure). But it does affect federal tax calculations before 1948.
0 -- no
1 -- yes

sepdis Indicator for state that has graduated rates and one set of brackets for all filers, but makes married filing separately disadvantageous, usually by requiring state filing status to be the same as federal. Even if married filing separate status is allowed in the state, we set **sepdis** = 1 if the state requires filing status to be the same as federal, because it is usually highly disadvantageous to choose married filing separate status in the federal income tax.

For North Dakota since 2001, there are two alternative taxes, one with multiple brackets for different filing statuses and one without. Separate filing is disallowed for the second tax even though it would be advantageous, so we set **sepdis** = 1.

0 -- No. This means that: the state has different brackets for different filing statuses; the state has a flat marginal rate structure (that is, there is only one tax rate); or the state has a single bracket structure for all and there is no provision to make filing separately disadvantageous.

1 -- Yes. (State has one set of brackets, but makes married filing separately disadvantageous or disallows it).

2 – One set of brackets, separate filing is disallowed or disadvantageous, but separate calculations are necessary in order to compute a special credit for married couples (Ohio 1973-present, Virginia 2000-present).

mardedtype Type of special deduction or credit for married couples. Note: the

calculator program ignores this variable, and any other variables mentioned below that are called upon by the **mardedtype** code (e.g., **mardedlim**), if **filertype** does not equal "m."

0 -- None

1 – Allows equivalent of federal two-earner deduction (applies 1982-1986 only, and only if filing jointly)

2 -- Lower-earning spouse's AGI is exempt up to a maximum amount contained in **mardedlim**. Applies in MD in recent years, where same filing status as federal is required.

3 -- Credit that is a % of lower-earning spouse's earned income. Percentage is contained in **mardedpct**, and dollar limit for credit is contained in **mardedlim**. Applies in SC, WI; in both cases married couples file jointly.

4 – Minnesota 2002- . If couple's taxable income is above threshold for the 2nd bracket of the ordinary tax (**b2**), tax is computed on earned income (wages and salaries, self employment income, pensions, and taxable social security) of lower-earning spouse using brackets for single person, and then to that is added tax computed using single brackets applied to couple's taxable income less earned income of lower-earning spouse. **Mardedlim** contains minimum earned income of lower-earning spouse necessary to qualify, and **mardedpct** contains minimum combined taxable income needed to qualify. Rates and brackets for singles are contained in the "extra" tax brackets and rates (**xbracknum**, **xb1-xb3**, and **xr1-xr3**).

5 – Virginia 2000- present. Credit against tax liability. Sti1 = min(larger of two spouse's AGI less retexamt1 less adult and age exemptions for that spouse, Sti/2). Sti2 = min(smaller of AGI-retexamt1-(adult and age exemptions for that spouse), Sti/2). Credit = min[**mardedlim**, max(0, StaxNORM - tax(Sti1)+tax(Sti2))] Joint taxable income of couple must be greater than **mardedpct** to be eligible for credit.

6 – Minnesota 1999-2001. The credit is provided in a table. Key parameters of this table are stored in **xb1-xb10** (see below), which are not otherwise being used for those years in Minnesota. Earned income is wages and salaries and self-employment income. The parameters stored in **xb1-xb10** are:
xb1: minimum earned income of lower-earning spouse to qualify
xb2: minimum combined taxable income for 1st credit schedule
xb3: combined taxable income where 2nd credit schedule begins to apply
xb4: 1st credit schedule, earned income needed to get maximum credit
xb5: 1st credit schedule, minimum credit

xb6: 1st credit schedule, maximum credit
xb7: 2nd credit schedule, minimum earned income to get credit
xb8: 2nd credit schedule, earned income needed to get maximum credit
xb9: 2nd credit schedule, minimum credit
xb10: 2nd credit schedule, maximum credit

7 – (Ohio, 1973-present). Credit is a percentage of state tax liability, where the percentage depends on the size of the couple's state taxable income. The maximum allowable credit is contained in **xagicrmax** (if **xagicrmax**=0, there is no limitation). A couple is only eligible for the credit if each spouse has federal AGI (less interest, dividends, royalties, rents, federally taxable social security, and capital gains) greater than **mardedlim**. The income categories and percentages are coded into **xbracknum**, **xb1-xb14**, and **xr1-xr14**.

9 – (Iowa, 1979-present). It is generally advantageous for married couples to file separately in Iowa, but unlike most states, if spouses file separately each spouse gets a standard deduction that is less than half of the standard deduction for a joint return. Each spouse filing separately gets a standard deduction equal to that for a single filer, which is coded into **mardedlim**.

10 – (North Dakota, 2007 – present). This is a non-refundable credit for two-earner married couples filing jointly (called the "marriage credit"), roughly similar to the Minnesota credit, but must be coded differently because the "x" variables are already used. The basic idea is to split up the taxable income of the spouses and calculate tax on each separately using the tax brackets for single taxpayers, and then provide a credit equal to the difference between that and ordinary joint tax liability, up to a limit. In order to calculate this, for married taxpayers we store the tax brackets for single taxpayers in the range **b11-b26** (so for example, **b11** for married couples should be the same as **b1** for single taxpayers, etc.). The tax rates are the same for singles and married filing jointly, so we don't need to do anything special with those, and **bracknum** should still be the number of brackets for married filing jointly (although note that if the number of brackets for single filers is different, there will have to be a change to the SAS code). Earned income of each spouse is defined as wage and salary income plus self-employment income plus taxable social security benefits and pension income. Take the earned income of the lower-earning spouse, subtract **mardedpct** (this is the standard deduction for a single filer plus one personal exemption), and run the result through the brackets and rates for a single filer. Then take the remainder of the couple's combined taxable income (after subtracting off lower-earning spouse's earned income less **mardedpct**) and run that through the brackets and rates for a single filer. Add the two tax liabilities together. The credit is the smaller of the amount by which ordinary joint tax liability exceeds the sum of the two tax liabilities computed using brackets and rates for single filers, and

mardedlim, but not less than zero. Note that the "marriage credit worksheet" for ND also lists two income thresholds below which the credit should not be calculated, but these are not stored in the data set because the other information above is sufficient to calculate the credit accurately (it will just be calculated as zero if the relevant income measure is below the threshold).

11 – Tennessee, 1976 - . For the exclusion for dividends and interest for the elderly that is coded into the **retex** variables (**retextype** = 13), the exclusion given to spouses that choose to file separately is equal to that given to singles, and is different than half of the amount given to joint filers. The exclusion given to each spouse that chooses to file separately (that is, the amount given to single filers) is stored in **mardedlim** for **filertype** = "m" only. If filing separately, each spouse must be **retexage** or above to claim the exclusion. For separate filers, the exclusion is phased if AGI is larger than **mardedlim**.

mardedlim Unless otherwise specified, dollar limit on two-earner couple deduction or credit.

mardedpct Unless otherwise specified, percentage used in computing two-earner couple deduction.

EXCLUSIONS

cgexpct Percentage of long-term capital gains excluded from AGI.
(Note: if **cgexpct** = 100, then it is assumed to apply to both **ltcg** and **othcg**. This was generally the case; when **cgexpct** = 100, it generally meant either that capital gains and losses of all types had no tax consequences, or that capital gains of all types were taxed under an alternative regime specified in **sptx**, **sptx2**, or **xtaxtype**. If **cgexpct** is any other number than 100, the calculator assumes that it applies only to **ltcg**). [In Hawaii in 1987, there was a 55% exclusion for capital gains until 3/31/87; calculator applies this to all gains that year.]

cgexamt Dollar amount of long-term capital gains excluded from AGI.

divexpct Percentage of dividends excluded from AGI.

divexamt Dollar amount of dividends excluded from AGI.

intexpct Percentage of interest income excluded from AGI.

intexamt Dollar amount of interest income excluded from AGI.

diexamt Dollar amount of dividends plus interest excluded from AGI.

PERSONAL EXEMPTIONS

expercap Dollar value of per capita personal exemption.
In other words, there is one of these for each family member. (Note: for North Carolina in 1995 and later years, see **miscextype** = 14, which affects the meaning of **expercap** in that case).

exreturn Dollar value of any "per return" exemption.
Usually, either there was a per capita exemption, as above, or there was an exemption amount for the return as a whole that depended on filing status (coded here in **exreturn**), plus separate exemptions for dependents. One approach or the other was used.

ex_dep Dollar value of exemption for each dependent.
Note that "dependent" does not include spouse. Also note that **ex_dep** should be zero if there is a "per capita" exemption, unless there is an additional exemption amount added on top of what the dependent already receives from the per capita exemption. Otherwise, there will be double-counting.

ex_age Dollar value of age exemption.
This is an extra exemption for each taxpayer and/or spouse aged 65 or over, and is added to any other applicable exemptions described above.

pctex Percentage exemption.
This is an exemption that is a percentage of AGI.

exlim Indicator for limitations on exemptions.
0 – No limitation

1 -- State follows federal personal exemption phase-out which has applied since 1991.

2 – State only allows exemptions to be deducted against the lowest brackets (e.g., Louisiana 1982-present). Note that there must be an initial zero-rate bracket for this to work (in Louisiana, the zero-rate bracket is equal to the per-return credit, and only the dependent and age exemptions are coded in to the exemption variables – these are then added to the top of the zero-rate bracket).

3 – When AGI exceeds a threshold equal to two times **exreturn,** exemptions are phased out at a rate of $1 for every $1 of AGI above the threshold. (Connecticut, 1992 – present).

4 – Personal exemption is phased-down as federal AGI increases, using a step function. Information about the phase-out is contained in the variables **xb8-xb14** and **xr8-xr14**. The following table indicates the exemption allowed per person for each range of AGI:

If AGI is	Exemption is
< **xb8**	expercap
between **xb8** and **xb9**	**xr8**
between **xb9** and **xb10**	**xr9**
between **xb10** and **xb11**	**xr10**
between **xb11** and **xb12**	**xr11**
between **xb12** and **xb13**	**xr12**
above **xb13**	**xr13**

Note that with exlim = 4, there is also an extra exemption for the elderly (**ex_age**) that is not phased out with income. (Maryland 2008 -).

exprorat Prorated exemption.
If this variable = 1, it means that the value of any exemptions calculated based on the exemption variables listed above must then be multiplied by the ratio of income taxable by this state to federal AGI, to determine the amount of exemption that may actually be used. This sometimes applied in states that only taxed a limited portion of income, such as dividends and interest.
0 -- Not applicable
1 -- Applicable

STANDARD DEDUCTION

For **filertype** = "m" (married couples), the values of the standard deduction variables are those allowed on joint returns. See **stdalloc** for how this is divided among spouses if they file separately (see also **marded** = 9 for a special case).

minstded Value of minimum standard deduction.
In some cases, the standard deduction was a percentage of AGI, subject to minimum and maximum dollar limits.

maxstded Value of maximum standard deduction.

If standard deduction is always just a single number for a given filing status, it is contained in maxstded, and minstded is set to zero.

minstded_d Dollar addition to minimum standard deduction for each dependent.

maxstded_d Dollar addition to maximum standard deduction for each dependent.

minstded_a Dollar addition to minimum standard deduction for each person aged 65 or over.

maxstded_a Dollar addition to maximum standard deduciton for each person aged 65 or over.

pctstded Percentage of AGI that is standard deduction.

0 -- Percentage standard deduction and minimum standard deductions are not applicable.

Any other number -- Standard deduction is this percentage of AGI, but standard deduction cannot be lower than **minstded** nor higher than **maxstded**.

zba Dollar value of zero bracket amount.
This is a standard deduction that is incorporated into the bracket structure (there is an initial bracket with a zero percent tax rate). The initial zero-rate bracket is coded into the bracket structure (in **b1** and **r1** below). When **zba** > 0, it means that only itemized deductions in excess of **zba** may be deducted.

PHASE-OUT OF STANDARD DEDUCTION

There are three instances where standard deductions are gradually phased out with income: Alabama (since 2007), Nebraska (1993-2005), and Wisconsin (since 1986). Information on how the phase-out works is contained in the variables **dpthresh1**, **dpthresh2**, **dprate1**, and **dprate2**, together with the other standard deduction variables listed above. If **dpthresh2** = 0 (Alabama, Nebraska, married and single in Wisconsin), then for every dollar of AGI above **dpthresh1**, **dprate1** cents of standard deduction are lost until the value of the standard deduction drops to **minstded** (which is zero in Nebraska and Wisconsin, but non-zero in Alabama). In Nebraska, the relevant form reports the increase in tax liability for each dollar of AGI above the threshold, so it is necessary to convert this to the equivalent If **dpthresh2** > 0 (head of household in Wisconsin), then for every dollar of AGI between **dpthresh1** and **dpthresh2**, **dprate1** cents of standard deduction is lost, and then for every dollar of AGI above **dpthresh2**, **dprate2** cents of standard deduction is lost until the standard deduction is reduced to zero. Note that all of the parameters of the standard deduction phase-out in Wisconsin

can be found for the most recent year only in a place on the Wisconsin department of revenue web site set up for software developers < http://www.revenue.wi.gov/taxpro/develop.html>, and can be derived from the law in other years.

dpthresh1 AGI threshold where phase-out of standard deduction starts.

dpthresh2 2nd AGI threshold used in calculation of standard deduction phase-out. Only applies in Wisconsin, since 1986; set this equal to zero for Alabama. In Wisconsin, phase-outs are pretty simple for single and married people, but complicated for a head of household. In 2000, for example, a single person loses 12 cents of standard deduction for every dollar of income above $10,380, until the standard deduction is reduced to zero. But a head of household loses 22.515 cents of standard deduction for every dollar of income above $10,380, up to the income level where the head of household standard deduction is just equal to the single standard deduction. That income level equals $30,350 in 2000 (that's **dpthresh2**). Then, for every dollar of income above $30,350 (**dpthresh2**), the head of household loses 12 cents of standard deduction, until the standard deduction is reduced to zero. In Wisconsin, **dpthresh2** is not reported in the tax instructions or the law (but it is availble for the most recent year through the web site mentioned above). The value of **dpthresh2** in Wisconsin can be calculated for any year by setting the formulas that determine the standard deductions for singles and heads of household equal to each other, substituting in known values, and then solving for **dpthresh2**. Y is income, a _S indicates value for singles, and an _H indicates values for heads of household.

maxstded_S - (**dprate1**_S/100)*(Y - **dpthresh1**) =
maxstded_H - (**dprate1**_H/100)*(Y - **dpthresh1**)

Solve for Y to get:

Y = **dpthresh2** =
{**maxstded**_H - **maxstded**_S +
[(**dprate1**_H - **dprate**1_S)/100]***dpthresh**1}
/ [(**dprate1**_H - **dprate1**_S)/100]

dprate1 Phase-out rate for standard deduction (percent).
For each dollar of AGI above **dpthresh1**, standard deduction is reduced by **dprate1** cents. For Alabama, calculate this as:
[(**maxstded** – **minstded**)/(AGI range over which phase-down occurs)]*100

dprate2 2nd phase-out rate for standard deduction (percent).

For each dollar of AGI above **dpthresh2**, standard deduction is reduced by **dprate2** cents.

GENERAL CREDITS

Note: all of the credits in this section are non-refundable. Any refundable credits will be coded in subsequent sections on retirement income exclusions or credits, low-income exemptions or credits, miscellaneous exemptions or credits, or earned income credits.

crpercap Dollar value of per capita credit.
In other words, one of these for each family member.
(Note: in Oregon starting in 2007, the per capita credit is partially phased out with income. To deal with this, we code the part that is not phased out in **crpercap**, and we code the portion of the credit that can be phased out in the **low** variables).

crreturn Dollar value of "per return" credit.
Same idea as **exreturn** above, but a credit.
[Note: in Idaho through 2007, there is both a per capita "grocery" credit and a filing fee, known in recent years as the "permanent building fund" tax. For Idaho, **crreturn** represents the value of the grocery credit for taxpayer and spouse minus the filing fee; grocery credits for dependents are coded separately. Starting in 2008 this is moved to **lowtype**=26 and **miscextype**=]

cred_dep Dollar amount of credit per dependent.
Same idea as **ex_dep** above, but a credit.

cred_age Dollar value of age credit.
This is an additional credit for each taxpayer and/or spouse aged 65 or over.

crphthresh AGI threshold where phase-out of all of the above credits starts.
If credits are not phased out, this is set to zero.

crphrate Phase-out rate for credits.
For each dollar of AGI above **crphthresh**, total value of above credits is reduced by (**crphrate** cents x number of credits). If credits are not phased out, this is set to zero.

ITEMIZED DEDUCTIONS

itemiz Are itemized deductions allowed, and if so, are they constrained in any

way by federal itemization status?

0 -- State does not have itemized deductions, generally (or tax is a percentage of federal tax liability so that this variable is ignored and state itemization status is effectively the same as federal).

1 --State has itemized deductions and itemization decision is completely independent of federal decision.

2 -- State has itemized deductions and state itemization status must be the same as federal.

3 -- If itemizing on the federal return, taxpayer may choose to itemize or to take the standard deduction on the state return. If taking the standard deduction on the federal return, the taxpayer must do the same on the state return.

4 -- State itemization status must be the same as federal. State itemized deductions are calculated by subtracting state income taxes (and sales taxes in 2004 and later years) from federal itemized deductions, but this subtraction cannot reduce state itemized deductions below the state standard deduction.

5 -- If taking the standard deduction on the federal return, taxpayer may choose to take the standard deduction or to itemize on the state return. If itemizing on the federal return, the taxpayer must itemize on the state return as well.

charded Deduction for charity. Note that this only applies to very general charitable deductions. Deductions or credits that are limited to, say, contributions to educational institutions, are not included. (Note: see **sptx** = *charcred* for a non-itemizer credit for charitable giving applying in NC).
0 -- No deduction for charity
1 -- Charitable contributions are deductible for itemizers. Applies to all taxpayers only if there is no standard deduction (e.g., MA 2001).
2 -- Itemized deduction for charity, and non-itemizer deduction that is the same as federal.
3 = Itemized deduction for charity, and non-itemizer deduction that is the same as the 1984 federal non-itemizer deduction.
4 = Itemized deduction for charity, and a deduction for people who did not itemize on their *federal* returns equal to 50% of charitable contributions in excess of $500 (MN, 1999-present).
5 = Itemized deduction for charity. In addition, if taking the standard deduction on the federal and state returns, taxpayer can take a non-itemizer deduction for charitable contributions that exceed $500. (CO, 2001, 2005-2008. Note that in CO, whether the non-itemizer deduction is

allowed each year depends on the state fiscal situation; a regulation is promulgated each year stating whether theh deduction will be allowed in that year or not.).

chlim Maximum charitable deduction as a percentage of AGI.
The calculator now imposes this limit when it is binding. Note that in a few cases a state defined the limit as a percentage of some measure of income close to but not quite the same as AGI, but we have not coded information on these minor differences into the data. The calculator's detailed output files provides information on whether the limit was binding in the variable **chlimbind**, which is set equal to zero if the charity limit is not binding at the state level, 1 if the charity limit is binding at the state level and carryover of donations in excess of the limit are not allowed, and 2 if the charity limit is binding at the state level and carryovers are allowed. We currently assume that if **chlim**<50, **itemiz**<2, and the state is not California, then carryovers of excess deductions are not allowed. We know this to be accurate from 1979 on, but have not yet checked carefully for earlier years.

sitded Is the state income tax deductible from itself?
0 -- No
1 -- Yes
Note that when the federal income tax allows an itemized deduction for the larger of state income taxes or state sales taxes (starting in 2004), the program assumes that states with **sitded**=1 also allow the larger of the two taxes to be deducted, and assumes that states with **sitded**=0 do not allow either tax to be deducted. The first assumption is generally accurate. The second assumption is sometimes inaccurate -- some states allow a deduction for sales taxes if sales taxes are deducted at the federal level. Taxpayers who are not on the AMT and who live in a state with an income tax would generally want to take the state income tax deduction rather than the state sales tax deduction, as the former is almost always larger and federal marginal tax rates are generally higher than state marginal tax rates. In those cases, ignoring this issue usually makes no difference. However, some taxpayers who are on the federal AMT might find it advantageous to claim the state sales tax deduction on the federal return (despite the fact that it will be disallowed by the AMT), so that they can claim it on the state return. We currently ignore this complication, because getting this completely right would require doubling the number of iterations used to calculate federal and state taxes. Federal and state tax liabilities would have to be calculated first with the income tax deduction and then with the sales tax deduction, and the choice between the two would depend on which led to the lower combined federal-state tax liability. Failing to do this probably comes at a small cost in terms of accuracy, but has large advantages in terms of the speed and simplicity of the program.

intded Are interest payments deductible?
0 -- No
1 -- Yes
Note: definition of deductible interest is assumed to be the same as federal, which is almost always accurate.

propded Is a property tax deduction allowed?
0 – No. Note that there are three cases (Indiana 1993 - present, Massachusetts 1990 - present, and New Jersey 1990 – present), where **propded** is coded zero, but where there is a special deduction for property taxes or rent allowed under certain circumstances. See **cbtype** = 10, 15, and 17 for those.
1 – Yes, but not if standard deduction is taken
2 – Yes, and if standard deduction is taken, there is a non-itemizer deduction for property taxes that is the same as the federal provision (applicable 2008 – 2009; see **Fnipropmax**).

saleded Is a deduction for retail sales taxes allowed?
0 -- No
1 -- Yes
(Note: in situations where the state only allows a deduction for the larger of state sales taxes and state income taxes, or situations where the state allows a deduction for sales taxes only if a deduction for sales taxes is taken in lieu of a deduction for income taxes on the federal return, set **saleded** to zero. See discussion of **sitded** above for how this is addressed in the calculator).

medded Is a medical expense deduction allowed?
If yes, details (e.g., limited to expenses beyond a certain percentage of AGI) are assumed to be the same as federal. In fact, historically states occasionally used different rules for medical expense deductions (e.g., a different percentage of AGI), but we have not yet incorporated this level of detail into the calculator.
0 -- No
1 -- Yes

dedfed Is the federal income tax deductible in the ordinary tax?

0 – No
In rare cases, it may be deductible in an optional maximum tax coded into the extra tax section below (e.g., Minnesota, Kansas, and Arizona for a small number of years during the 1980s or early 1990s)

1 -- Yes

limfdtype Type of limitation on deductibility of federal income tax:
Let fdtxliab = federal income tax liability.

0 -- There is no limitation on deductibility, or federal income tax is not deductible.

1 – Basic limitation:
If **limfdpct** = 0, then deduction = min(fdtxliab, **limfdamt**), where fdtxliab is federal tax liability after credits.
If **limfdamt** = 0, then deduction = (**limfdpct**/100)*fdtxliab.
If both **limfdamt** and **limfdpct** are greater than zero, then deduction = min[(**limfdpct**/100)***fdtxliab**, **limfdamt**]

2 -- Deduction =
if fdtxliab<= **limfdamt**, deduction = min(fdtxliab, **limfdamt**). Otherwise deduction = min(**limfdamt2**, **limfdamt** + (**limfdpct**/100)*fdtxliab-**limfdamt**).

3 – Deduction is limited to federal taxes attributable to income taxable under this state tax (for example, Massachusetts at one time only allowed deductions for federal income tax on labor and business income).

4 – Deduction is limited to 3% of "net income" (Wisconsin, 1941-61). Net income is AGI less itemized deductions other than federal income tax and charitable contributions.

5 – Arizona 1987-1989. If **limfdamt2** > 0 then deduction is:
min(**limfdamt2**, max((**limfdpct**/100)*fdtxliab,**limfdamt**)). If limfdamt2=0 then deduction = max((**limfdpct**/100)*fdtxliab,**limfdamt**).

limfdamt Dollar value of limit on deductibility of federal income tax. For married couples, this is the amount for a joint return; married filing separately is assumed to have a limit of half this amount.
0 -- Not applicable.
Amount > 0 – Dollar limit

limfdamt2 Dollar value of second limit on deductibility of federal income tax. For married couples, this is the amount for a joint return; married filing separately is assumed to have a limit of half this amount.
0 = Not applicable.
Amount > 0 – Dollar limit.

limfdpct Percentage limit on deductibility of federal income tax.
0 = Percentage limit not applicable.
Amount > 0 -- Percentage

asdfed Can taxpayers take the deduction for federal income taxes in addition to the standard deduction? (Note that this applies to both the normal tax and the "extra" tax, so that **asdfed** may be 1 even if **dedfed**=0).
0 -- No
1 -- Yes

sstxded Is the federal Social Security payroll tax deductible?
0 – No

1 – Yes. (Employee portion of Social Security and Medicare taxes and self-employment tax are deductible)

Amount > 1 – Same as 1, but there is a dollar limit to the deduction. The amount recorded in **sstxded** is the limit per taxpayer and/or spouse (in other words, each spouse can deduct his or her own social security tax up to the limit). Note that in Missouri, the instructions list a dollar limit for social security payroll tax, but that is simply the maximum amount it is possible to pay, so Missouri can be coded **sstxded** = 1.

itemlim Indicator for whether state follows federal limitation on itemized deductions (which applied 1991-present at the federal level).

0 = Federal itemized deduction limitation does not apply.

1 = Yes. If state income tax is not deductible from itself, then only that portion of state income taxes that are actually deductible at the federal level (after any limitation) are subtracted from federal itemized deductions to determine state itemized deductions. Also choose this if the federal limitation applies at the state level, and the state income tax is deductible from itself (**sitded** = 1).

2 = Yes. If state income tax is not deductible from itself, the full amount of state income taxes are subtracted from federal itemized deductions to determine state itemized deducitons.

50 = Same as 1, except that in addition, allowable itemized deductions are reduced to (**itemlim**/100)*(federal itemized deductions after federal limitation - **zba**). Applies in Louisiana, 2000-2001.

57.5 = Same as 1, except that in addition, allowable itemized deductions are reduced to (**itemlim**/100)*(federal itemized deductions after federal limitation - **zba**). Applies in Louisiana 2002, 2007.

65 = Same as 1,except that in addition, allowable itemized deductions are reduced to (**itemlim**/100)*(federal itemized deductions after federal limitation - zba). Applies in Louisiana 2008.

icredrate Percentage rate for itemized deduction credit.
This applies where itemized deductions are not actually a deduction, but rather a credit equal to a flat percentage rate times the amount by which certain itemized deductions exceed the state standard deduction. This applies only in Wisconsin starting in 1986. Which itemized deductions are allowable for purposes of the credit are determined by the indicator variables for each type of itemized deduction above.

idphthresh AGI threshold where itemized deduction limitation starts, for states that operate an itemized deduction limitation that works the same way as the federal one, but with different thresholds (e.g., Hawaii, California).

RETIREMENT INCOME EXCLUSIONS AND CREDITS

Meaning of variables **retex**, **retph1**, and **retph2** can depend on the value of **retextype** (see **retextype** for details). If phase-outs or phase-ins involve discreet jumps or notches, these are smoothed (phase-out is assumed to proceed at a constant rate between thresholds). Measure of income used to determine phase-outs is usually adjusted gross income or some close variant; unless otherwise specified, the calculator assumes AGI is used to determine phase-outs. Unless otherwise specified, phase-outs for separate filers are based on combined AGI in the case of a married couple. In general, the amount reported for **retex** for a married couple is the maximum amount available to the couple as a whole if both are eligible (if only one is eligible, for example due to age, then the default behavior is for the calculator to give them half of **retex**, unless otherwise specified below). In some cases, states provide different tax treatment for different types of pensions. For instance, in several states, maximum pension exclusion amounts are be different for government employee pensions relative to private pensions, and in one case (Alabama), exclusions are different for defined benefit versus defined contribution pensions. Because the data sets used with the tax calculator generally do not indicate the type of pension, we have not attempted to incorporate this level of detail into the calculator. In cases where tax treatment differs depending on type of penison, we use the treatment accorded to private defined benefit pensions.

retextype Type of retirement income exclusion or credit:

0 -- 100% of pension income excluded.

1 -- No special exclusion for pensions or any other retirement income. Note: this is the default. In cases where the state tax base only includes certain components of income like dividends or capital gains, (e.g., **base** = cg), set **retextype** = 1. Special exclusions should only be coded into **retextype** if the initial base of the tax is defined so as to include pensions or other retirement income in the first place.

2 -- Exclusion of pension income up to a dollar limit.

3 -- Exclusion applies to pensions, interest, dividends, rental income, and taxable social security benefits.

4 -- Maximum exclusion applies to pensions and social security combined.

5 -- Social security is subtracted from exclusion to obtain maximum pension exclusion.

6 -- Exclusion applies to all AGI.

7 -- Exclusion applies to all AGI, but social security is subtracted from maximum exclusion amount.

8 -- Pension credit that is phased in with size of pension; **retex** contains maximum credit amount, **retph1** has level of pension at which credit is fully phased-in, and **retph2** has level of pension income at which credit starts to phase in. Applies in Ohio.

9 -- Exclusion applies to pensions, dividends, capital gains, interest, and rental income.

10 -- Refundable credit.

11 -- Limited pension exclusion. Exclude a percentage of pension income, up to a dollar limit. Dollar limit of gross pension income to which the percentage can be applied is contained in **retex**, and percentage is contained in **retph1**. (e.g., Kentucky).

12 -- Non-refundable credit.

13 -- Exclusion for dividends and interest equal to **retex**, phased out based on AGI (phase-out thresholds are in **retph1** and **retph2** as usual). Married couples filing a joint return receive this exclusion as long as at least one spouse is aged **retexage** or above. If a married couple files separately, the exclusion available to each spouse is not half of retex, but rather is the amount for single filers, which is stored in **mardedlim** Tennessee, 1976 - .

14 -- Limited pension exclusion that works the same as **retextype**=2, except with some special features applicable in Arkansas 1985-present. In this case, if the pension exclusion is taken, the taxpayer cannot make use of the general age credit (**cred_age**), the working taxpayer tax credit (see **lowtype** = *18*), or the low-income tax tables (see **xtaxtype** = *lowtab1*, *lowtab2,* and *lowtab3*). This applies in Arkansas, 1985-present. In the

SAS code, it is implemented in the extra tax section where **xtaxtype** = *lowtab1*, *lowtab2,* and *lowtab3* are coded.

15 -- Choice of percentage of federal credit for elderly and disabled or this credit, which is a non-refundable credit equal to 9% times (pension benefits up to the amount in **retex** minus social security benefits), with the credit phased out starting at the threshold given in **retph1**, at a rate of 9 cents per dollar of income above that threshold.

16 -- Tax credit that is a percentage of tax liability for elderly, decreasing from 100% of tax liability to 0% of tax liability over phase-out range. With this type of credit, **retph1** and **retph2** refer to phase-out thresholds defined in terms of tax liability, not income. Note that **retex** represents income limit for eligibility. (Vermont 1971-1991; note that this is in the part of the SAS code for **taxtype** = "pctfed").

17 – Utah 1988-2007. Exclusion applying to all AGI. Exclusion equals max(0, **retex** – .5*max(0,**agi-retph1**)). Set **retph2** equal to zero in the tax parameter data set – it will be calculated by the program using the rule described above. Starting in 1994, the measure of income used to compute the phase-out is **agi** plus tax-exempt interest.

18 – Virginia 2004-present. There is an exclusion equal to **retex** for those with age >=**retexage**. The exclusion is phased-out with income for those born on Jan. 1, 1939 or later, and is not phased-out with income for those born before Jan. 1, 1939. The exclusion is phased-out at a rate of $1 for every $1 of AGI above **retph1**. Leave **retph2** = 0, the program calculates the appropriate value for that based on the rules above. For married couple filing separately where both qualify, the exclusion is calculated as for a joint filer, and then divided by two and given equally to each spouse. Those taking the low income credit are not eligible for any age deduction (those who are eligible for the low income credit would always be better off selecting that). Measure of AGI used to compute phase-out subtracts off any taxable social security benefits. If married filing separately, phase-out is based on joint AGI. Each spouse born before 1939 gets half of **retex** deduction; spouse born in 1939 gets half of **retex** subject to phase-out.

19 – Same as 2, except **retph2** represents the AGI threshold at which the phase-out of the pension exclusion ends only in the case where the pension is larger than **retex**. If the pension is smaller than **retex**, then the end of the phase-out range is actually **retph1** + **pension**. In addition, in Missouri, the pension exclusions for each spouse are added together, and then allocated to each spouse in proportion to their AGI. (Missouri 1999 - present).

20 – Montana, 1991-present. Same as 2, except that if married filing separately, the phase-out is computed using the AGI of each spouse separately (rather than using the spouse's combined AGI). Effectively, for a married couple, the combined income level at which the exclusion begins to phase out can be up to twice as large if filing separately than if filing jointly. In addition, the phase-out income range is half as wide for married filing separately as for married filing jointly. For married couples, the amount recorded for **retph1** applies to both joint and separate, and the amount recorded as **retph2** is the amount for joint filers. Note that because of a very narrow phase-out range, this feature can be a source of very high state marginal income tax rates, but these high rates are a legitimate feature of the law.

21 – Utah, 2008 – present. Non-refundable credit for the elderly that is phased-out with income. Maximum possible credit before phase-out is **retex**. Must be aged **retexage** or above to receive credit; if married and only one spouse is aged **retexage** or above, then maximum credit is half of **retex**. Income used to compute phase-out is AGI plus non-taxable interest (**teint**). Credit is reduced by **retph2** percent of the amount by which income exceeds **retph1**, until it reaches zero. As of 2008, there was only one tax rate in Utah, so the calculator assumes married couples file jointly; the SAS code for this provision will have to change if married filing separately becomes advantageous in Utah.

retex Usually, maximum retirement income exclusion or credit. For married couples, this is the amount if both spouses qualify; half of this amount applies if only one spouse qualifies.

retph1 Usually, AGI threshold at which phase-out of retirement income exclusion or credit begins. (May be used for other things if so specified in **retextype** above).

retph2 Usually, AGI threshold at which phase-out of retirement income exclusion or credit ends. (May be used for other things if so specified in **retextype** above).

retexage Minimum age to qualify for retirement income exclusion or credit (in years).

pctfdeldcr Percentage of federal credit for elderly and disabled (previously known as retirement income credit) allowed by state.

ssbentx Tax treatment of social security benefits
0 = Social security benefits are 100% excluded.
1 = Treatment same as current federal law.
2 = Social security benefits are fully taxable.

3 = Social security benefits are taxed based on pre-1994 federal law (i.e., up to 50% rather than up to 85% of benefits are taxable). This is only applicable if it is 1994 or later; before 1994, states that follow federal are coded as **ssbentx** = *1*.
4 = Same as 3, except that in addition 32% of the social security benefits that would otherwise be included in AGI are non-taxable. (Iowa, 2007-2008; note that the 32% figure is scheduled to increase gradually in later years, but this is not yet incorporated in the calculator. When it is, this will have implications for the SAS code for **lowtype**=14 and **xtaxtype**=maxtax as well.).
11 = Same as 1, except that all social security is exempt if federal AGI is $50,000 or less (Kansas 2007).
12 = Same as 1, except that all social security is exempt if federal AGI is $75,000 or less (Kansas 2008).

LOW-INCOME EXEMPTIONS OR CREDITS

Meaning of variables **low**, **lowdepamt**, **loweldamt**, **lowph1** and **lowph2** may depend on the value of **lowtype** (see **lowtype** for details). If phase-outs or phase-ins involve discreet jumps or notches, these are smoothed (phase-out is assumed to proceed at a constant rate between thresholds). Measure of income used to determine phase-outs is usually adjusted gross income or some close variant; unless otherwise specified, the calculator assumes AGI is used to determine phase-outs.

lowtype Type of low-income exemption or credit:

0 -- Nothing

1 -- Exemption

2 -- Non-refundable credit. Per-return amount of credit is in **low**, per-dependent amount of credit, if any, is in **lowdepamt**. [Note: in the case of Ohio, the income measure used to determine eligibility is taxable income, not AGI – this is hard-coded into the SAS program.]

3 -- Refundable credit

4 -- Per capita non-refundable credit. (Note: in Oregon starting in 2007, there is a credit that is partially phased-out; this is dealt with through a combination of **crpercap** and the **low** variables).

5 -- Pension and social security exclusion

6 -- Maximum tax (e.g., Massachussetts since 1987). Alternative maximum tax is zero below threshold, x% of (AGI-threshold) above the threshold. Threshold is in **lowph1**, and is adjusted by **lowphdep**. The x%

is in **low.** Maximum AGI to which provision applies is a multiple of the initial threshold; the multiple (1.75 in the case of MA) is contained in **lowph2**.

7 – Non-refundable per capita credit plus age credit (applies in Georgia)

8 -- Refundable per capita credit (Hawaii in recent years; Kansas food sales tax refund 1977-85, Vermont sales tax credit 1969-1973). Eligibility phased out for AGI between **lowph1** and **lowph2**. Taxpayer must be older than **lowminage** to qualify. Per capita credit amount is in **low**.

9 -- Special earned income credit not related to federal law. Available only if earned income is > 80% of gross income, and there is at least one dependent under 18. Credit equals **low** % of (**lowph2** – total federal income), where total federal income is AGI plus adjustments. Applies in Indiana since 1997.

10 -- Exclude all labor income (up to threshold amount) if AGI is less than threshold. (Threshold is in **lowph1**). MD 1989-1997; WV 1996-2006. In MD, labor income must be below the threshold as well, and the exclusion for separate filers was calculated based on joint income (so as long as the couple's whole earned income was below the threshold, then each spouse's earned income was wholly exempt). In WV, filing separately was disadvantageous during the relevant period.

11 -- Credit that is a % of labor income; eligible if AGI is below threshold. Percentage is in **low**, and threshold is recorded in **lowph1** and **lowph2** (they should be identical). Increase in threshold for each dependent is in **lowphdep**. (Maryland 1998 – present).

12 -- Credit equal to **low** percent of tax liability (before minimum taxes), phased-out using the thresholds defined in **lowph1, lowph2, lowphdep**, and **loweldamt**. In this coding scheme, **loweldamt** has an unusual meaning – it is an extra addition to **lowphdep** for the first dependent (this is relevant in PA 1974-1993). Used in: CA 1985-1991; CT 1995-present (called the "personal tax credit," shown in Table C of 2007 instructions); PA 1975-present (called the "tax forgiveness credit" in PA); WI 1998-present (called the "working families tax credit" in WI); WV 2007-present (called the "family tax credit" in WV). In CA, the credit is not allowed if taxpayer is subject to state minimum tax. In CA before 1987, the calculator sets the value of this credit to zero if **mtrvar** = **ltcg1** or **ltcg2**, because during this period, adding long-term capital gains to someone who previously had none would put the return on the minimum tax, eliminating the credit, and creating a large notch. Note that in Pennsylvania, the phase-out range is extremely narrow. Smoothing the credit reduction over the phase-out range would cause very high state

marginal tax rates, so in this particular case, we instead round the percentage used to compute the credit to the nearest 10% (which is how the actual credit is implemented in Pennsylvania). This produces large notches at the boundary points, but has no effect on marginal rates in between the boundary points. The notches are avoided if **ReverseMTR** is set to 1 when running the tax calculator. For similar reasons, the percentage used to compute the California low-income credit is rounded to the nearest 20% (as specified in the law – see for example CA Annotated Statutes 1988 Section 17069).

13 -- No-tax floor equal to federal filing threshold defined by standard deduction and personal exemption. A "no-tax floor" defines an income threshold below which there is no state income tax liability; if income is above that floor, then state income tax liability is computed according to ordinary income tax procedures (as a result, this often causes a "notch."). It is often implemented as a credit equal to state income tax liability for those with incomes below the threshold. Note that in DC, this is called the "low income credit," and taxpayers cannot take the low income credit and the DC earned income credit at the same time; the SAS code for **lowtype**=13 performs a special calculation for DC so that only the more advantageous credit is taken. (DC 1987-present, LA 1999-present, MD 1969-1988, OK 1983-1987).

14 – Iowa 1973 – present. No-tax floor equal to **low**, plus **loweldamt** if at least one spouse is aged **lowminage**. That is, people with AGI below the no-tax floor pay no income tax. In addition, if AGI is above the floor, the tax cannot reduce after-tax income below floor. In Iowa, if **ssbentx** does not equal 3, AGI is re-calculated using **ssbentx** = 3 for the purposes of this provision. The no-tax floor is clearly stated in the Iowa tax instructions; the provision that tax cannot reduce after-tax income below the floor is stated clearly in the Iowa Annotated Statutes Section 422.5, although it is not clear where this is implemented on the tax form. In the SAS code, **lowtype** = 14 is implemented immediately after **taxs** is computed.

15 -- Exemption, plus there is also a no-tax floor equal to federal filing threshold (e.g., both 1 and 13 apply). Phase-out and minimum age apply only to the exemption (OK 1988-present).

16 -- Refundable child credit equal to a fixed dollar amount (contained in **lowdepamt**) per federal child credit, for people with AGI below the phase-out thresholds. Note that it appears that low-income people who have no federal tax liability and are below the income threshold to make the child credit partially refundable would not be eligible for this credit in NC, which is why the federal child credit eligibility matters.

17 -- Refundable credit that is phased-in, getting larger with higher incomes. Minimum credit (given to anyone below the first threshold) is in **low**. Maximum credit for single and head of household is in **lowdepamt**, and maximum credit for married is in **loweldamt** (there was nowhere else to put them). Anyone with AGI above the second threshold gets the maximum amount, and the credit is gradually phased in between the thresholds. Applies in Colorado since 1997.

18 – Arkansas "working taxpayer tax credit," 1998-2002. If gross income < **lowph1**, then credit = **low** % of employee portion of OASDI tax. If gross income >= **lowph1**, then credit = **lowdepamt** % of employee portion of OASDI tax on the first **lowph2** dollars of taxable income. For married couples, a single credit is calculated based on the couple's total combined income. This credit may not be taken if the low-income tax tables are used (see **xtaxtype** = *lowtab1*, *lowtab2*, and *lowtab3*). The law indicates that the working taxpayer credit is already incorporated in the low-income tables, which apparently accounts for the minor change in parameter values for the **xtaxtype** = lowtab2 variables starting in 1998. This credit may not be used at the same time as the pension exclusion (see **retextype** = 14). Credit is non-refundable.

19 – Low-income allowance used in Wisconsin during 1970s and 1980s. A minimum standard deduction that starts at $2600 single, $3450 if single and elderly, $4000 married, $4800 if married and one spouse>=65, and $5700 if married and both spouses >=65. Add $800 for each dependent. Starts to phase out at incomes of $3200 (single), $4200 (single and >=65), and $5200 (married), $6200 (married, one spouse >=65), and $7200 (married, both spouses >=65). Adult portion phases down to a minimum of $1300 at an income level of $3600 (single), $4900 (single >=65), $6400 (married), $7900 (married, one spouse >=65), and $9700 (married, both spouses >=65). Dependent deduction phases down to zero between incomes of $5000 and $12,000 for all taxpayers. The adult portion of the minimum standard deduction must be taken in lieu of the regular standard deduction, but the dependent portion can be taken in addition to the regular standard deduction. Must choose between this and standard deduction. At end of phase-out range, low-income allowance is $1300 with no dependents or age 65 exemptions, and $400 (half of **lowdepamt**) higher than that for each dependent or age 65 exemption. Above top phase-out amount, use regular standard deduction. Add **lowphdep** to top of phase-out range (and $150 to the $1300 low-income allowance at this point) if *both* spouses are over age 65.

20 – No state tax liability after non-refundable credits if federal tax liability before credits plus federal AMT liability is zero. (Nebraska 1987-present).

21 – Kansas food sales tax refund, 1986-97. Refundable credit amount equals **low,** plus **lowdepamt** times the number of people in the household other than the head. Taxpayer must either be older than **lowminage**, or must have at least one dependent child under age 18, in order to qualify. Phased-out with income between **lowph1** and **lowph2**.

22 – Kansas "food sales tax refund," 1998-99. Refundable per capita credit equal to amount in **low**. Taxpayer must either be older than **lowminage**, or must have at least one dependent child under age 18, in order to qualify. If income is less than **lowph1**, credit amount = **low**. If income is between **lowph1** and **lowph2**, credit amount = **low** / 2.

23 – Kansas "food sales tax refund," 2000-present. Same as *22*, but one extra credit is granted to head of household, subject to the same phase-out rules as above.

24 -- Increase in dependent exemption value for taxpayers with AGI below certain thresholds (Alabama starting in 2007). The standard dependent exemption available to all taxpayers is stored in **ex_dep** (see above). The additional amount of dependent exemption given to taxpayers with AGI below **lowph1** is stored in low, and the additional amount of dependent exemption given to taxpayers with AGI between **lowph1** and **lowph2** is stored in **lowdepamt**. For example, in Alabama in 2007, the dependent exemption is $1,000 if AGI < $20,000, $500 if $20,000 <= AGI < $100,000, and $300 if AGI >= $100,000. In this case **ex_dep** = 300, **low** = $700, **lowdepamt** = $200, **lowph1** = 20000, and **lowph2** = 100000.

25 – Non-refundable credit with different phase-out thresholds for each family size (Arizona 1998 – present). Per-return amount of credit is in **low**, per-dependent amount of credit is in **lowdepamt**. Other **low** variables are ignored. The credit is only available to taxpayers with incomes below thresholds specified in the **xb** variables. The income level at which the credit is eliminated is: **xb1** for 0 or 1 dependent; **xb2** for 2 dependents; **xb3** for 3 dependents; **xb4** for 4 dependents; and **xb5** for 5 or more dependents.

26 – Idaho "grocery credit" starting in 2008. If state *taxable* income is less than **lowph1**, there is a per capita refundable credit equal to **low** per exemption. If state taxable income is greater than or equal to **lowph1**, there is a per capita refundable credit equal to **lowdepamt** (note the change from the usual meaning of **lowdepamt**). In either case, there is an additional refundable credit equal to **loweldamt** for each of taxpayer and spouse that is aged **lowminage** or above. (The "permanent building fund" tax is then subtracted from this credit – see **miscextype** = 19). The **lowph2** variable is not used and can be set to zero. Prior to 2008, a simpler

version of the grocery credit and permanent building fund tax was coded into the variables starting with "**cr**."

27 – Ohio, 1983-1988, choice between extra per capita exemption, or extra non-refundable per capita credit. The value of the per capita exemption is stored in **low**, and the value of the per capita credit is stored in **lowdepamt**. [The calculator addresses this by treating the extra exemption as itemized deduction, and then choosing itemization status based on whether or not the credit reduces tax liability by more than the exemption.]

low Usually, amount of low-income exemption or credit.

lowdepamt Usually, amount of additional low-income exemption or credit, per dependent.

loweldamt Usually, amount of additional exemption or credit, per person aged 65 or over.

lowph1 Usually, AGI level at which phase-out begins.

lowph2 Usually, AGI level at which phase-out ends. If the provision involves a "cliff" (that is, the full value of the provision is allowed below an income threshold, and nothing is allowed above the income threshold), this is handled by setting **lowph1** = **lowph2**. A provision that phases-in as income increases can be handled by setting **lowph2** as the income level at which the phase-in begins, and **lowph1** as the income level at which the phase-in ends.

lowphdep Increase in phase-out income thresholds for each dependent.
If initial threshold (**lowph1)** is zero, then this only applies to the top threshold; otherwise, it applies to both.

lowminage Minimum eligibility age for low-income credit or exemption.

MISCELLANEOUS ADDITIONAL EXEMPTION, EXCLUSION, OR CREDIT

miscextype Type of miscellaneous additional exemption, exclusion, or credit:
Note that the amount coded for **miscexamt** for married couples is assumed to be available to each spouse (so effectively the amount available to the couple as a whole is twice as large as the amount reported).

0 -- None

1 -- Interest exclusion, age 65 or over.

2 -- Exclusion of interest, dividends, and capital gains, minus pension exclusion, age 65 or over.

3 – Extra exclusion for pensions and social security for those aged 65 or over, above and beyond what is coded in for all ages in the **retex** variables.

4 -- Pension exclusion for those under age 60

5 -- Exclusion for pensions for those under age 65 (e.g. Utah 1973-1987, SC 1997-present). In Utah only, taxable social security benefits also counted as pension income. In SC there is also a larger exclusion for pensions for those aged 65 and above, but this is subtracted dollar-for-dollar from the exclusion for overall income for people aged 65 or above recorded in the **retex**, so it can safely be ignored.

6 – Utah 1988-2007. Exclusion for pensions and taxable social security benefits for those under age 65. Maximum possible exclusion per spouse is in **miscexamt**. Exclusion equals max(0, min(**miscexamt, retinc1**)*(**agex**<65) + min(**miscexamt, retinc2**)*(**agespx**<65) – .5*max(0,**agi-retph1**)), where **agex** is age of taxpayer, **agespx** is age of spouse, **retinc1** is pension income and taxable social security income of taxpayer, and **retinc2** is pension income and taxable social security income of spouse. Starting in 1994, the measure of income used to calculate the phase-out is **agi** plus tax-exempt interest.

7 – Refundable per capita credit, no phase-out.

8 – Oklahoma "Sales Tax Credit," 1990 – present. Refundable per capita credit allowed if income is below a threshold. Credit amount is in **miscexamt**. The income thresholds can vary depending on age and number of dependents, and are stored in the **sptx** variables. Income threshold for those aged 65 or above and having at least one dependent is stored in **sptxrate**; the income threshold for others is stored in **sptxex** (see documentation for **sptx** = misc8).

9 -- Extra exemption for first dependent only.

10 -- Refundable credit for those with income below $5000. Amount in **miscexamt** is for dependent; credit for taxpayer and spouse are half of that amount, each. (Massachusetts 1966-86).

11 -- Exclusion for AGI for those aged 62-64; subtract social security to get allowable exclusion (VA, 1991-94).

12 – Same as *11*, but social security no longer subtracted from exclusion (VA, 1995-2003).

13 – No tax floor. Floor is **miscexamt** for single, double that for head of household and married. This only removes ordinary tax, not minimum taxes. (California, 1974-1984).

14 – Extra personal exemption for people with AGI below **lowph1**. (NC, 1995-present). The personal exemption is **expercap** for people with AGI above **lowph1**, and **expercap** + **miscexamt** for people with AGI below **lowph1**. In the instructions for the NC income tax, the amounts for **expercap** and **expercap**+**miscexamt** are not reported directly; rather, the tax form starts with the federal personal exemption, and then the instructions report the amounts to subtract from the federal personal exemption to get to **expercap** and **expercap**+**miscexamt**.

15 – Extra personal exemption for each of taxpayer and spouse aged 65 or over, if AGI is less than $40,000. Amount of exemption per person is in **miscexamt**. (Indiana starting 1999).

16 – One extra personal exemption equal to **expercap** for a head of household (Kansas).

17 – Virginia, 2004-2005. Special grandfathered age deduction equal to **miscexamt** for people born in certain years. In 2004, the deduction applies to those born in 1940 and 1941; in 2005, it applies to those born in 1941. Those taking the low income credit are not eligible for any age deduction (those who are eligible for the low income credit would always be better off selecting that).

18 -- Exclude all labor income (up to threshold amount) if AGI is less than threshold. Threshold is in **miscexamt**. West Virginia's low-income exclusion is moved here starting in 2007 to make way in the "low" variables for a new family credit.

19 – Idaho “permanent building fund” tax starting in 2008. This is a lump-sum tax amount per return. Amount of tax is in **miscexamt**. People who are not required to file an Idaho return (that is, people with gross income less than the sum of the standard deduction and adult exemptions) are exempt from the permanent building fund tax. Before 2008 this was netted out of the grocery credit coded in **crreturn**. Starting in 2008 the grocery credit is in **lowtype** = 26, and the permanent building fund tax is here. (In the SAS code, the permanent building fund tax is still implemented as a net reduction in the grocery credit).

20 – Non-refundable credit for pension income and taxable social security benefits, Utah 2008 – present. This credit is only available to taxpayer or spouse aged below **retexage**. The credit before phase-out is equal to **xr2** percent of pension income or **miscexamt**, whichever is smaller. The income measure used for computing the phase-out is AGI plus tax-exempt interest (**teint**). The credit is reduced by **retph2** percent of the amount by which AGI exceeds **retph1**, until the credit is reduced to zero. As of 2008, there was only one tax rate in Utah, so the calculator assumes married couples file jointly; the SAS code for this provision will have to change if married filing separately becomes advantageous in Utah.

miscexamt Usually, maximum amount of miscellaneous additional exemption, exclusion, or credit. Note that the amount coded for **miscexamt** for married couples is assumed to be available to each spouse (so effectively the amount available to the couple as a whole is twice as large as the amount reported).

EARNED INCOME CREDIT TIED TO FEDERAL PROVISIONS

eictypestate Type of state earned income credit. [Note: **mintaxapp**=3 only works correctly with **eictypestate**=0 or 1; if eictypestate changes to a different value for Iowa (where **mintaxapp**=3) then the SAS code for **eictypestate** will have to change.]

0 -- State credit is a percentage of federal credit and refundable; **eicstate1** contains percentage of federal earned income credit; **eictypestate** also equals zero if there is no state earned income credit (in which case **eicstate1** will also be zero).

1 -- State credit is a percentage of federal credit, but non-refundable; **eicstate1** contains percentage of federal EITC (e.g., Iowa before 2007).

2 – (Maryland) State credit is a percentage of federal credit, and is partly refundable; **eicstate1** contains percentage of federal credit that is non-refundable. If non-refundable EIC is greater than state tax liability before credits (**StaxAMIN**), refundable credit is **eicstate2** % of federal EIC, minus **StaxAMIN**.
Non-refundable EIC (**eicstatenoref**) = (**eicstate1**/100)***Feic**
Refundable EIC:
if **eicstatenoref**>=**StaxAMIN** then
    eicstateref = max(0,(**eicstate2**/100)***Feic - StaxAMIN**) ;
else **eicstateref**=0 ;

3 -- State credit is a percentage of federal credit, and refundable, but limited to people with incomes below amount specified in **eicstate2** (e.g., New Jersey through 2006).

4 – Wisconsin. State credit is a percentage of federal credit, but percentage depends on number of qualifying children; **eicstate1** contains percentage for 1 child, **eicstate2** contains percentage for 2 children, and **eicstate3** contains percentage for 3 or more children.

5 -- (Rhode Island) State credit is a percentage of federal credit, and is partly refundable; **eicstate1** contains percentage of federal credit that is non-refundable. Refundable portion is:
(**eicstate2**/100)*max(0,(**eicstate1**/100)***Feic-StaxAX)**,
where **StaxAX** is state income tax after other credits. (Does not currently work with separate filing, which is irrelevant in RI; need to change SAS code if separate filing becomes advantageous in RI).

6 – Minnesota, refundable EIC, 1998 – present. This involves a lot of parameters, and the "extra tax" variables are already used for the marriage credit, so some parameters for the Minnesota earned income credit are stored in unused brackets and rates for the ordinary tax. For a taxpayer with no children, the state EIC is just **eicstate1** % of the federal credit. For a taxpayer with one child, credit is **r10**% of earned income between $0 and $ **b10** of earned income, plus **r11**% of earned income between $ **b11** and $ **b12** of earned income, minus **r12**% of max(AGI, earned income) over $ **b13**. For a taxpayer with two or more children, credit is **r20**% of earned income between $0 and $ **b20** of earned income, plus **r21**% of earned income between $ **b21** and $ **b22** of earned income, minus **r22**% of max(AGI, earned income) over $ **b23**. All of these parameters can be found by looking at the Minnesota tax form web site listed under "Working Family Credit Table algorithms," and then comparing the parameters there with the federal parameters for the same year. Taxpayer must be eligible for federal EIC in order to qualify for Minnesota EIC.

7 – Virginia non-refundable EIC starting 2006. EIC is **eicstate1** % of federal credit, and non-refundable, but cannot take EIC and the credit coded in the **low** variables at the same time.

8 – Illinois 2003-2006. EIC is refundable for taxpayers with an eligible child (**kids2** > 0), non-refundable if not. EIC is **eicstate1**% of federal credit.

eicstate1 State earned income credit as a percentage of federal EITC, unless otherwise specified in **eictypestate**.

eicstate2 See **eictypestate**

eicstate3 See **eictypestate**

TAX BRACKETS AND RATES FOR ORDINARY TAX

bracknum Number of tax brackets for taxpayer of this filing status.
So, for example, if tax liability is 5 percent of the first $10,000 of taxable income, plus 7 percent of taxable income between $10,000 and $20,000, plus 9 percent of taxable income above $20,000, **bracknum** is 3.

b1-b26 An array of 26 variables representing the dollar value at the bottom of each tax bracket. For example, **b1** gives the bottom of the first tax bracket (this should always be zero; any zero-bracket-amounts are coded directly into the bracket structure), **b2** gives the bottom of the second tax bracket, etc. Any brackets beyond **bracknum** are ignored and can thus be coded as zero.

r1-r26 An array of 26 variables representing the precentage marginal tax rate in each tax bracket. For example, **r1** is the percentage rate in the lowest tax bracket, **r2** is the percentage rate in the 2nd tax bracket, etc. Any rates beyond **bracknum** are ignored and can thus be coded as zero.

SPECIAL TAXES

sptx Type of special tax.
Notes: the particular components of income that are subject to a special tax rate below will also be subject to the ordinary tax on top of that unless an exclusion is specified in the ordinary tax (using the exclusion variables listed above). This **sptx** feature was used to code relatively simple special taxes where there was a single tax rate and at most a single exemption per filing status. More complicated additional taxes are coded using the variables starting with "x" later on in the variable list. Possible values for **sptx** include:

none – No special tax.

cgtax – Capital gains are taxed at a special rate.

dtax -- Dividends are taxed at a special rate.

ditax – Dividends and interest are taxed at a special rate.

dcgtax – Dividends and capital gains are taxed at a special rate.

dcgitax – Dividends, interest, and capital gains are taxed at a special rate.

dltax -- Dividends and labor income are taxed at a special rate.

cgmax1 -- Alternative maximum tax on capital gains. Pay smaller of regular tax, and regular tax recomputed without capital gains, plus **sptxrate** rate times capital gains. (HI 1958-1981).

cgmax2 -- Alternative maximum tax on capital gains, where any gains taxed below the maximum rate already continue to be taxed at those below-maximum rates. Any gains that would otherwise be taxed at a rate above **sptxrate** are taxed at **sptxrate**. This code currently only works correctly if the first tax rate which exceeds **sptxrate** is **r5**, **r6**, or **r7**, which was sufficient to get things right through 2008. When the data is updated for future years, care should be taken to check whether the first tax rate that exceeds sptxrate is outside the range **r5** – **r7**, in which case the SAS code will need to be modified. (AR 1991-1998, HI 1987-present).

cgexmd -- Capital gains exclusion applicable in Maryland in 1991.
Percentage exclusion for long-term gains =
For single or HoH: if AGI<$50,000: min(7500, .3LTCG);
if AGI> $50,000: max(min(.3CG,7500)-.5(AGI-50000),0)
For married: if AGI<$100,000: min(15000, .3CG);
if AGI> $100,000: max(min(.3CG,15000)-.5(AGI-100000),0)

maxpctfd -- Alternative maximum tax that is a percentage of federal tax liability, which is defined as (**Fdtxliab_bc** + **FtaxMIN** + **Famt**)
Examples: UT and NM in 1950s, ND 1981-2000.

vtmax -- Alternative maximum tax applying in Vermont, 1969-1974.
Regular tax was 28.75% of federal tax liability.
Actual tax = V - max(T+V - T(TI+V*) – (**sptxrate**/100)*(AGI+cgex), 0),
where V=ordinary VT tax liability, T=ordinary federal liability, T(.) is federal tax function, V* is any VT state income tax liability deducted on federal return, AGI is federal AGI, and cgex is capital gains excluded at the federal level.

cgexmax – Exclusion for long term capital gains (**ltcg**) equal to the larger of **sptxex** and (**sptxrate**/100)***ltcg**. New Mexico, 2003 - .

cgexmax2 – Limit on exclusion for long-term capital gains (**ltcg**) applying in Vermont starting in 2008. Excluded capital gains are the smaller of **cgexpct** percent of **ltcg**, or **sptxrate** percent of federal taxable income.

kidcred –Refundable credit equal to **sptxrate** percent of the federal child credit. There is also a minimum credit amount equal to **sptxex** per child if **Fagi** < **Fkidcthresh**. (The credit is only allowed for children aged 4 or above, but that provision is ignored for now). New York starting in 2006 ("Empire State Child Credit").

diothcgtax – Dividends, interest, and **othcg** are taxed at **sptxrate**.

masstax – If **othcg** >= 0, (**div** + **int**) is taxed at **r1** percent, and **othcg** taxed at **sptxrate** percent. If **othcg** < 0, (**div** + **int + othcg**) is taxed at **r1** percent. (Massachusetts, 1999-present).

cgcred – Non-refundable credit equal to **sptxrate** percent of capital gains. Enter a positive number for **sptxrate**, the program converts it into a credit (it is treated as a negative special tax liability). (Montana, 2005 – present).

charcred -- Non-itemizer credit for charitable giving. For people who do not itemize on their federal returns (state itemization status is required to be the same as Federal), there is a non-refundable credit equal to **sptxrate** percent of the amount by which charitable contributions exceed **sptxex** percent of AGI. The calculator includes this credit in **gencred** (North Carolina, 1997 – present).

misc8 – The sptxex and sptxrate variables are used to store information needed to compute the credit described in **miscextype** = 8 (see the documentation for that).

maxtax – An alternative maximum tax equal to **sptxrate** percent of federal AGI. Taxpayer pays the smaller of this, or tax liability after AMT, special capital gains computations, and all credits except for circuit breaker credit and earned income credit. Circuit breaker credit and earned income credit are the only credits that can be used under either tax. (This is called the "alternative flat tax" in RI, 2006-present).

ueitax – "Unearned income tax," New York 1987-1988. "Unearned income" is defined here is AGI less labor income and removing all capital gains and losses. If AGI is less than **sptxex**, the taxpayer is exempt from the tax. If AGI is more than twice **sptxex**, then the tax is **sptxrate** percent of unearned income. The percentage rate gradually phases in from zero to **sptxrate** for AGI between **sptxex** and twice **sptxex**.

sptxex Usually, exemption for special tax. (But see **sptx** for exceptions). Note that in Massachusetts, the value of **sptxex** (set to zero in the IncTaxState data set) is determined in the SAS code as the value of exemptions determined by the variables with names beginning with **ex** that have not been used up to offset ordinary tax liability.

sptxrate Usually, rate for special tax (percent). (But see **sptx** for exceptions).

sptx2 Second special tax. Can be *ditax*, *cgtax*, *surtax,* or *ltcgtax.*
The first two have the same meaning as for *sptx*. The last two are defined below.

surtax – A special surtax that phases out the benefits of marginal tax rates below the top rate for people with adjusted gross income above a certain level, applying in NY starting in 2006. The SAS code currently assumes the top rate is **r5**, and will have to be changed if the number of tax rates in NY changes, so make a note if this happens. If **agi** > **sptxex2**, then the surtax makes **StaxNORM** = **StaxNORM**
+ max(0,(**r5**/100)***sti – StaxNORM**)
*min(1,max(0,(**agi-sptxex2**)/(**sptxrate2** – **sptxex2**)))

ltcgtax – **ltcg** is taxed at **sptxrate2**. (MA 1995-2007). Note that in MA, long-term gains were taxed at different rates depending on holding period; sptxrate2 is the rate applying to the longest holding period.

sptxex2 Exemption for special tax (or first threshold for **sptx2** = "surtax").
Note that in Massachusetts, the value of **sptxex2** (set to zero in the IncTaxState data set) is determined in the SAS code as the value of exemptions determined by the variables with names beginning with **ex** that have not been used up to offset ordinary tax liability, less **sptxex**.

sptxrate2 Rate for special tax (or second threshold for **sptx2** = "surtax")

EXTRA TAX

Note: A * indicates that the variable has the same meaning and possible values as its counterpart in the ordinary tax (i.e., the variable with the same name except without an "x" at the beginning). These cases are noted where applicable elsewhere in the documentation.

xtaxtype Type of extra state tax. Possible values:

none – No extra tax is applicable.

paratax -- Parallel tax on some measure of income. Starting income measure is defined in **xbase**, then exclusions, deductions, and exemptions specified in rest of the variables for the tax are subtracted.

paracred -- Tax credit based on some measure of income (e.g., Wisconsin 1961). Produces a positive (or zero) amount, which is then subtracted from ordinary tax liability.

maxtax -- Optional maximum tax. Taxpayer can choose between this tax and the ordinary tax. (IA 1988-present, KS 1989-1991, MN 1985-86, ND 2001-present, OK 1979-2005, OR 1939-1943, UT 2007-). In North Dakota since 2001, the "xtax" is called the "optional method tax" and is filed on Form ND-2. In Iowa 1988-present the maximum tax is called the "alternate tax." Treatment of separate filing differs by state and is hard-coded. As of 2008, among cases with a maxtax, the calculator only allows separate filing in Iowa and Oregon. In Iowa, for separate filers the alternate tax must be calculated based on the couple's joint income, and then allocated to each spouse in proportion to AGI. In Oregon, the maximum tax was calculated separately for each spouse.

liabtax -- Tax on ordinary state tax liability after credits (e.g., Kentucky in 1950s).

liabcred -- Credit that is a percentage of tax liability after credits (e.g., California '69)

dagi -- Tax on dividends where rate depends on AGI (e.g., Connecticut in 1970s).

diagi -- Tax on dividends and interest where rate depends on AGI (e.g., Connecticut in 1970s and 1980s)

agicred – Credit that is a percentage of tax liability, where the percentage depends on AGI. Includes brackets, where bracket amount depends on AGI and rate is percentage of tax liability that is forgiven. Also allows exemptions (in which case the credit is a function of AGI less exemptions). Credit cannot exceed **xagicrmax**. In general, this credit is a percentage of tax liability before any minimum taxes. In the case of CT, this is taken care of through the **mintaxapp** variable. In the case of CA, it is taken care of in the code for **xtaxtype**=agicred.

mintax -- Minimum tax. In all cases, most details of operation of state minimum taxes, alternative minimum taxes, and taxes on tax preferences are included below in the separate section on minimum taxes tied to federal law (see documentation for **mintaxtype**). The one exception occurs when there are a large number of brackets and rates in the minimum tax (e.g., California 1975-86). In that case, **xbase** = *mintax*, and the exemptions, brackets, and rates of the minimum tax are contained in the variables for the "extra tax." The rest of the details about such a tax are in the minimum tax variables.

cgmax5 – Works the same as federal **Fxtax** = cgmax5, but with different rates (state rates and brackets are in **xb1-xb2** and **xr1-xr2**). (RI 2001 -).

lowtab1 -- Special low-income table applicable in Arkansas, 1973-1990. This is an alternative to the regular tax calculation. The only "extra tax" variables that matter for this are **xtaxtype**, **xb1**, **xb2**, and **xex_dep**, **xcrreturn**, and **xcred_dep**. All other "extra tax" variables are ignored. If **income** < (**xb1** + min(**deps**, 2)***xex_dep**)**,** then tax liability is zero. If **income** = (**xb2** + min(**deps**, 2)***xex_dep**), then tax liability equals **xcrreturn** + min(**deps**, 2)***xcred_dep.** Tax liability gradually phases in between these two thresholds, with changes at AGI increments of $10 (this is incorporated in the SAS code to prevent enormous marginal tax rates). If **income** > (**xb2** + min(**deps**, 2)***xex_dep**), then taxpayer is not eligible for the special low-income table. Married taxpayers must file jointly to use the low-income table. If the special low-income tax table is used, then the retirement income exclusion may not be used, and no credits can be taken.

lowtab2 -- Special low-income tax table applicable in Arkansas, 1991-2006. The only "extra tax" variables that matter for this are **xtaxtype**, **xbracknum**, **xb1** through **xb6**, and **xr1** through **xr6**. All other "extra tax" variables are ignored. If AGI is less than **xb1**, then tax is zero.

If **xbracknum** = 4, then tax liability is as follows. For AGI between **xb1** and **xb2**, tax gradually increases from **xr1** to **xr2**. For AGI between **xb3** and **xb4**, tax gradually increases from **xr3** to **xr4**. People with AGI above **xr4** are ineligible for the low-income tax table.

If **xbracknum** = 6, then tax liability is as follows. For AGI between **xb1** and **xb2**, tax gradually increases from **xr1** to **xr2**. For AGI between **xb3** and **xb4**, tax gradually increases from **xr3** to **xr4**. For AGI between **xb5** and **xb6**, tax gradually increases from **xr5** to **xr6**. People with AGI above **xr6** are ineligible for the low-income tax table.

Married taxpayers must file jointly to use the low-income table. The retirement income exclusion and the working taxpayer credit (**lowtype**=18) may not be used with the special low-income tax table. The per-return credit, elderly credit, and dependent credit can still be used with the special low-income tax table (they are subtracted out after finding tax on the low-income table). During this period the special low-income tax tables were published directly in the law and instructions, without any explanation of the logic underlying them. Our coding scheme captures the major non-linear aspects of the tables, and then smoothes between them.

lowtab3 -- Special low-income table applicable in Arkansas, 2007-present. The only "extra tax" variables that matter for this are **xtaxtype**, **xb1**, **xb2, xb3,** and **xb4**. All other "extra tax" variables are ignored. Married taxpayers must file jointly to use the low-income table. First calculate tax by applying regular tax table to AGI less standard deduction. Then apply a special non-refundable credit equal to 100% of tax liability if AGI is below an exempt amount **xb1** (or **xb1** + **xb3** for married couples with 2 or

more dependents). For those with incomes above the exempt amount, there is a credit that starts at 80 percent of the amount of ordinary tax that would be imposed on someone with a taxable income equal to the exempt amount defined above, less the standard deduction. The credit is then phased out in a linear fashion as AGI rises, until the credit is completely phased out at an income of **xb2** (or **xb2** + **xb4** for married couples with two or more dependents). The retirement income exclusion may not be used in conjunction with the special low-income tax table. The per-return credit, elderly credit, and dependent credit can still be used with the special low-income tax table (they are subtracted out after finding tax on the low-income table). The logic of the special low-income table during this period is spelled out in Section 26-51-301 of the Arkansas Annotated Statutes.

maxei -- Maximum tax on personal service income (NY 1978-1986). Personal service taxable income (PSTI) = [(Personal service income - deductions) / AGI]*(State taxable income) - (tax preferences as defined under state minimum tax). Personal service income is essentially wages and salaries and business income, and deductions are business expenses and moving expenses. There is a non-refundable credit equal to the tax calculated by applying the extra tax brackets and rates to PSTI. The resulting credit is stored in the variable **xcredit**.

liabcred2 -- Credit that is a percentage of tax liability after general credits but before credit for child and dependent care expenses. The percentage phases down with AGI from 100% to 0%, and the starting and ending thresholds depend on family size. (Actually, "modified" AGI is used, but this is ignored because the main modificaiton depends on tax exempt municipal bond interest). Family size is defined as taxpayer plus spouse plus **kids2**. Starting and ending thresholds for one-person families are in **xb1** and **xb2**, respectively. Thresholds for two-person families are in **xb3** and **xb4**. Thresholds for three-person families are in **xb5** and **xb6**. Thresholds for families with four or more members are in **xb7** and **xb8**. Other extra tax variables are not used and can be set to zero. In the detailed output data, the value of this credit is in **xcredit**. (Kentucky starting in 2005).

lowexempt – An extra exemption equal to **xexpercap** times the number of family members, phased-out with **agi**. If **agi** > **xb1**, then the exemption equals:
(1+(**filertype**="m")+**deps)***max(0, **xexpercap** - (**xr1**/100)*(**agi-xb1**)).
All other extra tax variables are ignored and can be set to zero. In SAS code, this is in the section where **lowexamt** is defined, and it is included in **lowexamt**. New Mexico starting in 2006.

cb – "x" variables are used to store information used to calculate a circuit-breaker property tax credit. See documentation for **cbtype** for further information.

cbex – **xb1-xb6**, **xr1-xr6**, and **xbracknum** are used to store information used to calculate a circuit breaker property tax credit. The number of brackets used for the circuit breaker credit should be stored in **xbracknum**. See documentation for **cbtype** for further information on that. In addition, **xb8-xb14** and **xr8-xr14** are used to store information used to calculate a phase-down of personal exemptions. See documentation for **exlim** for further information on that (Maryland, 2008 -).

marded – "x" variables are used to store information used to calculate a special marital deduction or credit. See documentation for **mardedtype** for an explanation.

low – "x" variables are used to store information used to calculate a special low-income credit or exemption. See documentation for **lowtype** for an explanation.

mintax2 – **xb1** and **xb2** are used to help calculate the state's alternative minimum tax. See **mintaxtype** = 3 for explanation. Other "x" variables are ignored.

kidcare – "x" variables are used to store information used to calculate a credit or deduction for child care expenses. See **kidcaretype** for an explanation.

lowcred – Refundable per-return tax credit. Credit starts at **xcrreturn**, and is gradually phased-out with AGI between AGI levels **xb1** and **xb2**. The only "x" variables used are **xtaxtype**, **xcrreturn**, **xb1**, and **xb2**; all other "x" variables are ignored. (Hawaii, 2007 only, called "credit for general income tax").

utahcred – Non-refundable credit that is related to federal personal exemption and standard deduction or itemized deductions, and is phased out with income. Applies in Utah starting in 2008. To calculate the credit, first multiply federal personal exemptions (after federal phase-out) by (**xr1**/100). To that, add the federal standard deduction (if the taxpayer did not itemize on the federal return), or federal itemized deductions (after federal limitation) less the portion of state income tax that was deducted on the federal return (if the taxpayer did itemize on the federal return). Multiply the total by (**xr2**/100) to get the credit before phase-out. If AGI > **xb1,** then reduce the credit by (**xr3**/100) times the amount by which AGI exceeds **xb1**, but do not reduce the credit below zero. (The tax

calculator output for this variable is stored in **gencred**, and the calculation is in the **gencred** section of the program). All other "**x**" variables are ignored by the calculator. The standard deduction, personal exemption, and itemized deduction variables in the ordinary state tax (e.g., **expercap**, etc.) should be set to zero in this case, as the credit for those things is calculated entirely using the information in the **x** variables. However, **itemiz** should still be coded to reflect any restrictions imposed on the calculation of the credit by federal itemization status; as of 2008, the state credit calculation required the taxpayer to use itemized deductions if itemizing on the federal return and standard deduction if not itemizing on the federal return. Note that **xr2** is also used to compute the credit specified in **miscextype** = 20 in Utah.

nmrebate – Special one-time refundable tax credit in New Mexico, 2005, based on income and number of exemptions. The credit phases down with AGI between thresholds **xr1** and **xr2**. Those with AGI below **xr1** get the maximum credit, those with AGI above **xr2** get the minimum credit, and credit gradually phases down for those with AGI between **xr1** and **xr2**. Maximum and minimum credit amounts depend on number of exemptions, and are stored in the following variables.

Number of exemptions:	1	2	3	4	5	>=6
Maximum credit:	**xb1**	**xb2**	**xb3**	**xb4**	**xb5**	**xb6**
Minimum credit:	**xb7**	**xb8**	**xb9**	**xb10**	**xb11**	**xb12**

The resulting credit is stored in **lowcredref**. (Source: 2005 N.M. ALS 3).

fedtab2 – Louisiana, 1980-1982. During this period, there were two alternative tax computations. The first option is was based on taxable income, and calculator computes this tax based on the the variables for an ordinary state income tax (**taxtype** = pctinc). The section option was an alternative maximum tax that was based on tables produced by the Louisiana legislature. The tables indicated the Louisiana state tax liability that corresponded to each federal tax liability for each filing status and each number of exemptions. The law did not explain the underlying logic that was used to construct the tables. Taxpayers paid the larger of the first tax, or 70 percent of the second tax (the 70 is stored in **xr14**). The second tax works exactly the same as **taxtype** = *fedtab*, and the exact same procedure and variables were used to code it in, so see documentation for **taxtype** = *fedtab* for details. The only difference is that the resulting tax is stored in **xtaxs**, not **taxs**. Note that **xtaxs** is the amount before multiplying by 70 percent. The variable **taxs** will then be set to the smaller of the ordinary tax or 70 percent of **xtaxs**.

xbase Base of extra tax. (See **base** for further details).
If **xtaxtype** takes on any of the following values: *paratax*, *paracred*, *maxtax*, *liabcred, liabtax, agicred, dagi, diagi*, then **xbase** indicates the

base that forms the starting point of the tax or credit calculation. It is analogous **base** in the regular tax. If **xtaxtype** takes on any other value besides those mentioned above, then **xbase** is ignored by the calculator and is generally set to *none*. (Occasionally in cases where the value of **xbase** doesn't matter, we have assigned the same value to **xbase** as to **xtaxtype**, but this has no effect). Values used for *xbase* when it matters include:
gi – Gross income

cg – Capital gains

div – Dividends

di – Dividends and interest

dcg – Dividends and capital gains

dcgi – Dividends, interest, and capital gains

fti – Federal taxable income

agicred – Adjusted gross income, used only for **xtaxtype** = agicred.

liabcred – State tax liablity (specifically **StaxAGC**), used only with **xtaxtype** = *liabcred*.

liabtax -- State tax liablity (specifically **StaxAGC**), used only with **xtaxtype** = *liabtax*.

none, or other value that is the same as **xtaxtype** – either there is no extra tax / credit, or the value of **xbase** is ignored by the calculator and so does not matter.

xosa1st Are other features not specified below the same as in the 1st (ordinary) tax?
0 -- No, none of the other features apply
1 – Yes, all of the other features apply. If **xosa1st** = 1, then adjustments subtracted from gross income to get to AGI, and deductions and credits governed by the **retex**, **low**, and **miscex** variables, are all assumed to apply in the extra tax. [Hard-coded exceptions: in the Utah and Iowa versions of **xtaxtype** = maxtax, the **retex**, **low**, and **misex** deductions are not allowed (although credits are), and in Iowa if **ssbentx** > 3, income for the maxtax is re-calculated using **ssbentx**=3.]

xcgexpct *

xdivexamt * [Note: this is hard-coded to apply to both dividends and interest in OK

in 1981. Otherwise it just applies to dividends.]

xdivexpct *
xintexpct *
xexpercap *
xexreturn *
xex_dep *
xex_age *
xpctex *

xnotaxflr Value of no-tax floor for extra tax. If AGI is below this floor, no tax is charged; above this floor, full amount of tax is charged.

xminstded *
xmaxstded *
xpctstded *
xcrpercap *
xcrreturn *
xcred_dep *
xcred_age *

xagicrmax Maximum allowable AGI-related credit. If zero, no limit applies. (Only applicable if **xbase** = *agicred,* or **mardedtype**=7).

xcharded *
xchlim *
xdedfed *
xintded *
Note: if **xintded** = 1, then other itemized deductions not specified for this extra tax are the same as in the first (ordinary) tax.

xsitded *

xitemlim Indicator for whether state follows federal limitation on itemized deductions (which applied 1991-present at the federal level).

0 = Federal itemized deduction limitation does not apply.

1 = Yes. If state income tax is not deductible from itself, then only that portion of state income taxes that are actually deductible at the federal level (after any limitation) are subtracted from federal itemized deductions to determine state itemized deductions.

xbracknum *
xb1-xb14 *
xr1-xr14 *

MINIMUM TAXES TIED TO FEDERAL LAW

Note: state minimum taxes and alternative minimum taxes are tied very closely to federal law, but sometimes adopt a slightly different base than the federal base. Any major differences between state and federal AMT tax bases are incorporated directly into the programming and are not reflected in the state tax law parameter data, but are noted below.

Abbreviations used in explanations of variables:
AMTI = federal alternative minimum taxable income.
TAMT = federal tentative alternative minimum tax (before subtracting normal tax liability).
AMT = federal alternative minimum tax liability (after subtracting normal tax liability).
AMTEX = exemption for federal alternative minimum tax.
mintax = federal minimum tax

mintaxtype Type of minimum tax

0 – None

1 -- Addition to tax = percentage of federal tax preference income in excess of **mintaxex**. During 1978-82, include the tax preferences from both the federal minimum tax and the AMT. From 1983 on, include AMT tax preferences but not adjustments. Base is re-calculated to deal with differences between federal and state in capital gains exclusions and deductibility of state income tax. New York 1970-present, California before 1975.

2 -- Addition to tax = liability from applying graduated rate structure to federal tax preference income in excess of exemptions. Brackets, rates, and exemptions are stored in **xb1**-**xb15**, **xr1**-**xr15**, **xbracknum**, and **xexreturn**. Tax preference income means same thing as in 1. (CA 1975-1986).

3 -- Addition to tax = [(**mintaxrate**/100)*(AMTI - AMTEX)] - ordinary state income tax liability. (CA 1987-present, CO 1987-present, MN 1985-present, WI 1987-present). Note that in California since 1987, the AMT exemption and the income level at which it begins to phase out are different than federal. These are contained in **xb1** and **xb2**, respectively. There are some other state-specific idiosyncracies in this type of tax that are incorporated directly into the SAS code, and need to be checked when the state tax data is updated. Wisconsin allows a subtraction from AMTI for its special capital gains exclusion. Colorado allows a subtraction from AMTI for its retirement income exclusion. Minnesota's calculation only allows charitable contributions to the extent they exceed 1.3% of AGI (in 2002) or 1% of AGI (2003-2005; unlimited charitable deduction was restored starting in 2006). Minnesota also removes appreciation on charitable donations from AMTI during the years it was included in

federal AMTI. From 1993 through 2002, California added capital gains on charitable donations of appreciated property to federal AMTI (they were included in both federal and CA AMTI 1987-1992). California also allows a deduction for up to $1 million of self-employment and closely-held business income.

4 -- Addition to tax = [(**mintaxrate**/100)*TAMT] - ordinary state income tax liability. (CT 1992, ME 1991-present, RI 2001-2002, VT 2001, WV 1983-present).

5 -- Addition to tax = [(**mintaxrate**/100)*(AMT+mintax)]. (IA 1982-1984, MN 1977-1984, NE 1987-present, WI 1986). For purposes of computing this state minimum tax, AMT and minimum tax (mintax) are re-calculated to account for differences between federal and state taxable income – for instance, differences in capital gains exclusions or deductibility of state income tax from the normal tax. In Minnesota and Wisconsin, itemization status used to compute the minimum tax is same as federal. For other states, itemization status can be different than federal for purposes of computing the minimum tax, but currently the code is only set up to handle such situations when **itemiz** <= 3, and to handle separate filing when **itemiz** <= 2 (which was sufficient to deal with Nebraska and Iowa).

6 -- Addition to tax = min[(**mintaxrate**/100)*TAMT, (**mintaxex**/100)*AMTI] - ordinary state income tax liability. (CT 1993-present).

7 – Iowa 1985-present. Addition to tax = [(**mintaxrate**/100)*(AMTI - **mintaxex**)] - ordinary state income tax liability (IA 1985-present). AMTI is not identical to federal; it is recalculated based on state itemization decision, and state income tax is not a preference item (since it is not deductible from the ordinary Iowa income tax). Standard deductions and personal exemptions are not added back into AMTI either. The SAS code for this currently only works correctly if **mintaxapp**=3 (which it has throughout the history of this provision in Iowa). A note relevant for updating the data: this particular kind of state AMT requires the state itemization decision to be deferred until after **taxs** has been computed under each itemization status, which led to a variety of fixes that work given Iowa's particular tax features through 2008, but not necessarily under other tax features. As a result, if complicated new features (for example, an alternative capital gains tax computation or **sptx**) are added to the Iowa income tax after 2008, care must be taken throughout the SAS code to make them work correctly with **mintaxtype**=7.

8 – Rhode Island. Addition to tax = (**mintaxrate**/100)*(TAMT recalculated with different exemptions) – ordinary state income tax

liability. The exemptions work the same way as in the federal AMT (including phase-out), but the maximum exemption values are contained in **mintaxex.** (RI 2003-present). Note that **mintaxrate** is not necessarily reported directly on the RI AMT form – rather, the RI AMT form reports rates that are to be multiplied by AMTI less exemptions. **Mintaxrate** is found by dividing the rates reported on the RI AMT form into the rates applying over the same income ranges in the federal AMT. (So for example, if over a certain income range, the RI rate is 6.5% and the federal rate is 26%, and 6.5 / 26 = 25%, so **mintaxrate** = 25). This version of state AMT also allows for an alternative capital gains tax calculation in the AMT that is similar to that in the federal AMT, but with different maximum rates, which is implemented if **xtaxtype** is set equal to *cgmax5,* as it is in RI starting in 2001.

9 – Maine. Addition to tax = (**mintaxrate**/100)*(TAMT recalculated with different exemptions and some adjustments) – ordinary state income tax liability. The exemptions work the same way as in the federal AMT (including phase-out), but the maximum exemption values are contained in **mintaxex.** In addition, any social security benefits included in AGI at the federal level, and any pension income excluded at the state level, are subtracted from the measure of AMTI used to recalculate TAMT. (Maine 2003-). Note that the Maine instructions do not report **mintaxrate** directly, but rather report the rates that apply to different ranges of Maine alternative minimum taxable income (AMTI). For example, in 2008, the Maine AMT is 7% of AMTI below $175,000, and 7.6% of AMTI above $175,000. This is equivalent to 27% of the federal AMT tax rates on the same ranges of AMTI (7% Maine rate / 26% federal rate = 27%, and 7.6% Maine rate / 28% federal rate = 27%). So in 2008 **mintaxrate** = 27, because the Maine AMT is essentially 27% of what the federal tentative alternative minimum tax would be on Maine AMTI.

10 -- Addition to tax = [(**mintaxrate**/100)*AMT] - ordinary state income tax liability. (WV 1983-present).

mintaxrate Rate of minimum tax, percent

mintaxex Exemption for state income tax

mintaxapp Where does the minimum tax apply? This variable is basically about what measure of tax liability is compared to the minimum tax when computing minimum tax liability.

0 – No minimum tax.

1 – Applies to normal tax before credits, but after any "special" taxes

(**sptx** and **sptx2**). So the minimum tax is generally either computed as tentative minimum tax minus normal tax before credits, or is simply added to normal tax before credits and then after that credits are subtracted. This is the most common approach.

2 – Minimum tax is calculated after extra tax and all credits (including earned income credit). Tax liability after all credits is used in the formula for computing the minimum tax. (New York, 1970-present).

3 – Iowa 1985-present. Minimum tax applies after all other taxes and credits, including non-refundable earned income credit. However, refundable earned income credit (which starts in 2007), is subtracted off *after* computing the minimum tax. The minimum tax is computed as tentative minimum tax less tax liability after maximum tax and all credits except refundable EIC. This minimum tax can affect the optimality of itemizing and of filing a separate versus joint return, so in the SAS code those decisions are not finalized until after a tentative value of final tax liability after credits but before minimum tax (**taxs**) is computed.

4 – Minimum tax applies after **agicred** and **lowcred** but before other credits (CT, 1992 – present; SAS code for this is not set up for separate filing, since it is not advantageous in CT).

5 – Minimum tax applies after low-income credit and itemized deduction credit, but before EITC, married couple credit, and homestead credit (WI, 1986-present; SAS code for this is not set up for separate filing, since it is not advantageous in WI).

STATE CREDITS OR DEDUCTIONS FOR CHILD CARE

Age limits for qualifyig dependents are assumed to be the same as in the federal law. In general, state child care credits that are a percentage of the federal credit apply the percentage to the full value of the federal credit, not just the usable portion after taking the minimum of the federal credit and federal tax liability. This is the default treatment used unless otherwise specified below. Federal expenses eligible for deduction or credit are **Fkcareded.** Federal credit amount is **Fkcarecred** (a variable computed by the program).

kidcaretype Type of child care credit or deduction

0 – None

1 – Itemized deduction, definition of eligible expenses same as current federal law.

2 – Above-the-line deduction, definition of eligible expenses same as current federal law.

3 – Itemized deduction, definition of eligible expenses and phase-out with income operate the same as the deduction that applied in the federal income tax 1972-1975 (see **Fkcaretype** = 3). Maximum deduction is $2400 for one child, $3600 for 2, or $4800 for 3 or more. Deduction is phased out with income for all filing statuses. Full deduction available if AGI<$18,000; deduction reduced by 50 cents for each dollar of AGI above $18,000. (Numerous states in 1976; SC 1976-1984; Montana 1976 – present).

4 – Massachusetts above-the-line deduction. Choice of deduction for eligible federal expenses or alternative deduction of **kc1** (one kid) or **kc2** (two or more kids), even if there are no dependent care expenses. Maximum allowable child care expenses increase above federal level, in **kc3** (1 kid) and **kc4** (2 or more kids) starting in 2001. There is also an addition to the personal exemption for a working spouse 1967-86. Extra exemption is min(**kc5**, lower-earning spouse's earnings), plus an additional exemption of **kc6** if those earnings are below **kc5**.

5 – Itemized deduction. Maximum total deduction for 1, 2, and 3 or more kids are in **kc1**, **kc2**, **kc3**. Income at which phase-out begins is in **kc4**, income at which phase-out ends is in **kc5**. If **kc5** is zero, then **kc6** has cents of deduction lost per dollar of income above bottom threshold (AZ 1954-89, KY 1976-89, MD 1964-66, NY 1956-60, OK 1962-70).

6 – Itemized deduction. Each spouse must have income below **kc1** + dependent exemptions. Maximum deduction is earnings of lower-earning spouse. (GA 1954-70).

7 – Itemized deduction, not phased out with income. Maximum eligible expenses are in **kc1** (1 kid) and **kc2** (2 kids). (NC 1975-80)

11 – Percentage of federal credit. Percentage is in **kc1**. **kc2** contains information on allocation of credit between spouses in cases where separate state returns are filed. If **kc2** = 0, credit can be allocated however sposues choose. If **kc2** = 1, then only lower-earning spouse can take the credit. If **kc2** = 2, then credit must be divided between spouses in proportion to AGI. (In a state where filing a joint return is advantageous for married couples – i.e., **multbrk** = 1 or **sepdis** = 1 – this generally does not matter, so set **kc**=0).

12 –Credit, percentage of federal credit, phased down with income. Percentage below phase-out range is in **kc1**, percentage above phase-out range is in **kc2**, income at bottom of phase-out range is **kc3**, and income at

top of phase-out range is **kc4**. Maximum eligble expenses for 1 kid and 2 or more kids are in **kc5** and **kc6** (both are zero if same as federal).

13 – Credit, percentage of eligible expenses. Percentage is in **kc1**. Maximum eligble expenses are **kc2-kc4** for 1-3 kids. If maximum eligible expenses are the same as zero, **kc2-kc4** are set to zero and the calculator applies the current federal limits. Note that the SC instructions list a maximum possible credit, but through 2008 this was just kc1 percent of the maximum federal limits on eligible expenses, so the maximum credits are already imposed by the calculator and don't need to be coded in separately. (GA 1982-86, SC 1984 -).

14 –Credit, percentage of federal expenses, phased down with income. Percentage below phase-out range is in **kc1**, percentage above phase-out range is in **kc2**, income at bottom of phase-out range is **kc3**, and income at top of phase-out range is **kc4**. Maximum eligble expenses are in **kc5-kc6** for 1-2 kids (all zero if same as federal).

15 – Percentage of federal credit up to a dollar maximum. State credit is a percentage of the minimum of the federal credit and federal tax liability. Percentage in **kc1**, dollar maximum in **kc2** (Louisiana, 1986-2002).

16 – If federal AGI is **kc1** or below then credit is **kc4** percent of the federal credit, and is refundable. Else if federal AGI is **kc2** or below, then the state credit is **kc5** percent of the federal credit, and is non-refundable. Else if federal AGI **kc3** or below, then the state credit is **kc6** percent of the federal credit and non-refundable. Else if federal AGI is **kc3** or above, the state credit is the smaller of **kc6** percent of the federal credit or $25 and is non-refundable. Starting in 2006, for people with federal AGI <= **kc1**, the state credit is calculated as a percentage of the federal credit for child and dependent care expenses *before* taking the minimum of federal tax liability and the federal child care credit. In all other cases (before 2006 or for AGI > **kc1**) the state credit is calculated as a percentage of the federal credit after taking the minimum of the federal child care credit and federal tax liability. (Louisiana 2003 – present).

17 – Same as *12*, but based on minimum of federal credit and federal tax liability before credits. (Colorado – also offers an alternative of a fixed credit per child under age 5, which is not coded into the calculator).

18 -- % of federal credit, refundable up to a maximum, non-refundable beyond that. % in **kc1**, maximum in **kc2**. (Maine) Note that technically, the percentage recorded in kc1 is the percentage that applies to "quality" child care expenses; other child care expenses get a smaller percentage. Since we have no data on whether any particular child care expenses

qualify as "quality" under Maine law, the calculator assumes all child care expenses are quality.

19 – Minnesota 1977-present. **kc1** = % of federal credit (except for 1983 when **kc1** is applied to 20% of eligible federal expenses). **kc2** = maximum credit, 1 kid, **kc3** = maximum credit 2 or more kids. **kc4** = income at lower phase-out threshold. **kc5** = income at upper phase-out threshold, 1 kid. **kc6** = income at upper phase-out threshold, 2 or more kids.

20 – Same as 12, but refundable below top phase-out level, non-refundable above (Nebraska).

21 – New Mexico 1981(?) – present. Credit is **kc1** percent of expenses. Maximum allowable expenses are in **kc2**, **kc3**, and **kc4** for 1 kid, 2 kids, or 3 or more kids, respectively. Subtract off federal credit actually used. Only available if income is below **kc5**.

22 – New York, 1996-2000. Percentage of federal credit = **kc1** + **kc2***min(**kc3**, max(0, **kc4**-AGI))/**kc5**. [Note: these parameters are not apparent in the tax form instructions; they are laid out in the NY annotated statutes, section 606(c).]

23 – New York, 2001-present. Same as 22, but if AGI>**kc6**, then **kc1-kc5** are contained in **xb1-xb5**. [Note: these parameters are not apparent in the tax form instructions; they are laid out in the NY annotated statutes, section 606(c).]

24 – Two-tier credit. **kc1**% of federal credit if AGI<**kc2**, **kc3**% of federal credit if AGI<**kc4**, zero above **kc4**. (Ohio 1993-present).

25 – Oregon 1976. **kc1**% of expenses. Maximum eligible expenses for 1-3 kids are in **kc2-kc4**. Lose **kc6** cents of credit per dollar of AGI above **kc5**.

26 – Oregon 1997-present. Taxpayer can take both of two credits. First credit is **kc1**% of expenses, phased down to **kc2**% at AGI between **kc3** and **kc4**, and is non-refundable (**kidcareref** refers to first credit). Second is refundable, and its parameters are in **xb1-xb4.** Credit is **xb1**% of federal credit. Phase out starts at an income of **xb2** + **xb3***(household size – 1). The credit is fully phased out at an income level approximately 1.25 times the initial phase-out threshold. Note that the value of **xb3** is not exactly the same for each increment in household size due to rounding error (the table in the instructions rounds everything to the nearest $50), so we use a rough average value rounded to the nearest $25. The 1.25 figure is not precisely right either due rounding error, but the calculator approximates by making the end of the phase-out threshold 1.25 times the

beginning. Household earned income must be greater than **xb4** to qualify for 2nd credit.

27 – Vermont 2003-present. Refundable **kc1**% of federal credit if AGI <= **kc3**. If AGI > **kc3**, non-refundable **kc2**% of federal credit.

28 – Maryland, 2000-present. Above-the-line deduction for child care expenses, definition of eligible expenses same as current federal law (same as **kidcaretype** = 2). In addition, there is a credit equal to a percentage of the federal child care credit that phases out as federal AGI increases. The credit is **kc1** percent of the federal credit if AGI is below **kc3,** is **kc2** percent of the federal credit if AGI is above **kc4**. The percentage phases down fairly smoothly from kc1 to kc2 between income levels **kc3** and **kc4** (the credit works the same as **kidcaretype**=12).

29 – Oklahoma (2008 -). There is a non-refundable credit equal to the greater of **kc1** percent of the federal credit for child and dependent care expenses, and **kc2** percent of the federal child tax credit. Returns with AGI greater than kc3 are ineligible for the credit.

kidcareref Is the child care credit refundable? (Note: in some cases the state child care credit is refundable for some taxpayers but not for others. In those cases, that information will be incorporated into **kidcaretype**, which will supersede **kidcareref**).
0 – no
1 -- yes

kc1-kc6 Parameters of state child care credit or deduction. The meaning of each of these is determined by **kidcaretype**.

ALLOCATION OF DEDUCTIONS, EXEMPTIONS AND CREDITS BETWEEN SPOUSES WHEN FILING SEPARATELY

Note: in general, if one spouse chose to itemize deductions instead of taking the standard deduction, then both were required to do so, so the calculator assumes this unless otherwise specified. Also note that in many states, spouses are allowed to file separately on the same return (sometimes called a "combined return"), or separately on different returns. In the event that the rules differ depending on whether the spouses file separately on the same return or separately on different returns, we use the rules for spouses filing separately on the same return (combined return).

itemalloc Allocation of itemized deductions between spouses

0 – Filing separately not allowed or not advantageous; or there are no itemized deductions; or each spouse must report his or her "own" deductions; or itemized deductions may be allocated between spouses in any way they choose. In latter two cases, any deduction for federal income tax usually must be allocated by % of AGI, but otherwise deductions are fairly fungible.

1 – Must be allocated in proportion to spouse's share of AGI

stdalloc Allocation of standard deduction between spouses filing separately

0 – Filing separately not allowed or not advantageous; or each spouse filing separately gets 50% of maximum standard deduction for a joint return, or percentage of AGI.

1 – Each spouse filing separately gets full value of maximum standard deduction for a joint return, or percentage of AGI

2 – Standard deduction can be allocated any way the spouses choose

3 – Allocated in proportion to spouse's share of AGI

4 – Standard deduction can be allocated in any way the spouses choose, except it can't exceed **pctstded** percent of each separate taxpayer's AGI.

exalloc Allocation of exemptions between spouses filing separately

0 – Not applicable because there are no exemptions or because filing separately not allowed or not advantageous; or same as federal treatment. Same as federal treatment means that adult exemptions for the whole return can be divided in any way they choose; adult per capita exemptions and age exemptions must go to the adult to whom they relate; and dependent exemptions must be taken by the adult providing over half of support.

1 – Adult exemptions must go to the adult to whom they relate; dependent exemptions can be divided between spouses filing separately in any way they choose.

2 – Adult exemptions divided equally between spouses. Dependent exemptions to adult providing over half of support.

3 – Allocated in proportion to spouse's share of AGI

4 – All exemptions can be divided in any way the spouses choose

5 – Joint filing not allowed. Spouse gets 2/3rds of adult exemption and all dependent exemptions, other spouse gets 1/3rd of adult exemption. Spouses can choose who gets what. (North Carolina, 1927-1988)

6 -- Adult exemptions divided equally between spouses. Dependent exemptions to adult providing over half of support. Adult exemption reduced by $300 if filing separately (North Dakota 1967-88).

7 – Spouses must file separately, each one gets half of exemption listed for married couples (New Hampshire 1923-1980).

credalloc Allocation of credits between spouses filing separately

0 – Not applicable, or separate spouse tax liabilities are combined before applying credits

1 – Credits must be allocated separately to each spouse. Adult credits go to the adult to whom they relate, and dependent credits can be allocated in any way desired.

2 – Credits must be allocated separately to each spouse. Adult credits go to the adult to whom they relate, and dependent credits go to the spouse providing more than half of the support.

3 – Adult credits divided equally between spouses filing separately, dependent credits go to spouse providing more than half of the support.

CIRCUIT BREAKER PROPERTY TAX CREDITS

(The initial draft of the documentation for circuit breaker property tax credits was written by Rosemary Smith).

Circuit breaker property tax credits are coded into the calculator based on the year of income used to calculate the credit. So for example if the property tax credit form says "2007," but 2006 household income is used to compute the credit, then the credit is assigned to the year 2006.

In general, variables for circuit breaker property tax credits are divided into three sections: (1) those that apply to all eligible taxpayers; (2) those that apply to people at or above the age specified in the variable **cbage;** and (3) those that apply to the people below the age specified in **cbage**. Variables in groups (1) and (2) all start with "**cb**" and variables in group (3) start with "**xcb**". Note, however, that specific variables may be used for different purposes than usual in some cases; if so, this will be made clear in the description of **cbtype** below.

In the documentation below, when the word "income" is not in bold, it is a generic term for income, which is defined more specifically in the variable **cbincdef** (the specific measure of income used to calculate property tax credits is called **cbincome** in the program). When in bold, **income** refers to the variable in the taxpayer input data set.

Unless otherwise indicated, a percentage of rent, **cbrenteq**, is considered equivalent to property taxes, (**xcbrenteq** for those below **cbage**) and the term "property tax" is meant to include both property taxes paid directly, and rent counted as equivalent to property tax.

In general, phase-ins and phase-outs that operate in a "step function" pattern have been smoothed and approximated.

Circuit breaker variables applying to all eligible taxpayers

cbtype Type of circuit breaker property tax credit.

1 – General category that captures many states. [California 1967-1976 and 1981-1997, Colorado, Iowa 1973-1974 and 1982-present, Kansas 1973-present, Maine 1971-1988, Michigan, Minnesota 1967-1974, Missouri, Nevada 1973-1974, North Dakota, Oklahoma, Pennsylvania 1971-1979 and 1991-present, Vermont 1969-1972, Nevada].

Regardless of age, if **cbmaxhome** > 0, then property tax on value of home greater than **cbmaxhome** is not eligible for credit (an exception is KS starting in 2007, where no credit at all is received if home value is greater than **cbmaxhome**). If **cbmaxrent** > 0, then rent greater than **cbmaxrent** is not eligible for credit. If **cbmaxcr2**>0, property tax above **cbmaxcr2** is set to equal **cbmaxcr2** when calculating the credit.

For people equal to or above **cbage**, credit is equal to **cbpct1** of property taxes above a percentage of income floor. Credit is capped at a maximum of **cbmaxcr1** if **cbmaxcr1** > 0. Credit is phased-out starting at income **cbthresh1** and ending at income **cbthresh2**. The percentage of income floor starts at **cbfloor1** and rises to **cbfloor2** – it phases in starting at income **cbthresh3** and ending at income **cbthresh4**. A percentage **cbrenteq** of rent is considered equivalent to property tax.

For people below **cbage**, credit is equal to **xcbpct1** of property taxes above a percentage of income floor. Credit is capped at a maximum of **xcbmaxcr1** if **xcbmaxcr1** > 0. Credit is phased-out starting at income **xcbthresh1** and ending at income **xcbthresh2**. The percentage of income floor starts at **xcbfloor1** and rises to **xcbfloor2** – it phases in starting at income **xcbthresh3** and ending at income **xcbthresh4**. A percentage **xcbrenteq** of rent is considered equivalent to property tax.

(Note that in Iowa, there is a credit for the non-elderly that works similarly to that for the elderly, but it is only paid out if the legislature chooses to appropriate funds for it for a particular year. Since we have no information on whether that happens, we've chosen to ignore the non-elderly credit in Iowa).

2 – [Arizona]. Works the same as *1* except that when **cbthresh5**>0, if **homeval** exceeds **cbthresh5** then no credit at all is received. Also, from 1977 on, there is no fixed percentage that is assumed to be property tax for renters; rather, the landlord reports actual property tax payment to tenant.

Given that data on this is generally unavailable, we set **cbrenteq**=25 during these years.

3 – [Arkansas, Connecticut 1973-1984, Idaho, New York, Oregon 1971-1972]. Works the same as *1*, except that credit does not phase-out between incomes **cbthresh1** and **cbthresh2**. Instead, maximum credit does. Maximum credit starts at **cbmaxcr1** and falls to **cbmaxcr2**, starting to phase-out at income **cbthresh1** and ending at income **cbthresh2**. The credit is eliminated above income **cbthresh5**. For people aged under **cbage**, the same system applies except values are in the **x-variables**. Also, if **cbmaxhome**>0 and **homeval** exceeds **cbmaxhome** or if **cbmaxrent**>0 and **rentpay** exceeds **cbmaxrent**, no credit at all is received.

4 – [California 1977-1980]. Works the same as *1* except that values in **x-variables** apply to renters.

5 – [Connecticut 1985-present]. For those aged **cbage** or above, for renters the credit is equal to **cbpct1** percent of property tax above percent of income floor **cbfloor1**. Credit must be between maximum credit **cbmaxcr1** and minimum credit **cbmaxcr2**, which are phased-out between incomes **cbthresh1** and **cbthresh2**. Credit is eliminated at **cbthresh2**. For homeowners, credit is equal to percent **cbpct2** of property tax, phased-out between incomes **cbthresh1** and **cbthresh2**. Homeowner's credit must be between maximum credit **cbthresh3** and minimum credit **cbthresh4** which are also phased out between incomes **cbthresh1** and **cbthresh2**. Percent of rent equivalent to property tax is **cbrenteq**. For all ages there is also a system (only exists after 1996) in the **xcb** variables that works the same as *1* except there is a minimum credit of **xcbmaxcr2**.

6 – [DC, Montana, South Dakota, Utah 1977-1981, West Virginia 1971-2000,]. Works the same as *1*, except that percent of property tax eligible for credit falls from **cbpct1** to **cbpct2** between incomes **cbthresh1** and **cbthresh2**. Above **cbthresh5** credit is eliminated. Same system applies to those under **cbage** in the **x-variables**. If **homeval**>0 and **cbmaxhome**>0, then if **homeval** exceeds **cbmaxhome** no credit at all is received. Percent of rent equivalent to property tax is **cbrenteq**.

If **xcbpct1** is set to zero, then there is no special credit for people under age **cbage**. But in that case if **xcbmaxcr1** > 0 then there is instead a credit for homeowners of all ages that is simply the smaller of **xcbmaxcr1** and the homeowner's property tax bill. When **xcbpct1** is zero, then all other "**xcb**" variables except for **xcbmaxcr1** are ignored. (This last provision applies in Montana in 2007).

7 – [Hawaii]. If income exceeds **cbthresh1** or if **rentpay** is less than **cbmaxrent**, no credit at all is received. Otherwise, credit is equal to the

sum **cbmaxcr1** plus an additional **cbmaxcr2** for each qualified exemption. These exemptions are: spouse aged over **cbage** and each dependent (**deps**). Credit does not apply to homeowners. Same system applies to those under **cbage** but values are in the **xcb**. There's actually only one credit applying to people of all ages, and the credit is **cbmaxcr2** times the number of exemptions; but there are extra exemptions for people aged 65 or above, and we deal with that by coding the amount that a single filer or couple would receive if aged 65 or above into **cbmaxcr1**, the amount that a single filer or couple would receive if under age 65 into **xcbmaxcr1**, and the amount per dependent in **cbmaxcr2** and **xcbmaxcr2**.

8 – [Illinois 1975-present]. A percentage **cbpct1** of the portion of property tax above percent of income **cbfloor1** is potentially eligible for credit. The maximum credit starts at **cbmaxcr1** when income is $0, and then phases down smoothly to **cbmaxcr2** at income **cbthresh1**. The credit is eliminated above incomes **cbthresh2** (for <3 person household) or **cbthresh3** (for >= 3 person household). Percent of rent equivalent to property tax is **cbrenteq**. Applies to people aged **cbage** or older.

In addition, there is also a non-refundable "homeowners property tax credit" against income tax equal to **xcbpct1** percent of property tax, available to homeowners of all ages. The "**xcb**" variables are otherwise not used for **cbtype** = 8. Because the homeowners property tax credit is more like an alternative to an itemized deduction, the calculator applies it regardless of the value of **cbinclude**; it is included in the value of **gencred** and calculated in that part of the program. [Chapter 35, Article 2, Section 208 of Illinois Code, starting 1991.]

9 – [Illinois 1972-1974]. As with *8*, maximum credit starts at **cbmaxcr1** when income is $0, and then phases down smoothly to **cbmaxcr2** at income **cbthresh1**. The credit is eliminated above **cbthresh2**. The portion **cbthresh3** of income faces percent of income floor **cbfloor1** while the remainder of income faces percent of income floor **cbfloor2**. Percent of rent equivalent to property tax is **cbrenteq**. Applies to people aged **cbage** or older.

10 -- [Indiana]. For people aged **cbage** or above, there can be a credit coded into the **cb** variables that works the same as *1*. In addition, there is available to all taxpayers an above-the-line deduction for all property taxes up to a maximum deduction of **xcbmaxcr1** for renters and **xcbmaxcr2** for homeowners. For renters, the property tax equivalent for this deduction is **xcbrenteq**. The **cb** part of the credit (for people above **cbage**) was eliminated starting in 1982.

11 – [Iowa 1975-1981]. Works the same as *1* except that those with income below **cbthresh5** have a minimum credit of **cbmaxcr1**.

12 – [Kansas 1970-1972, Maryland 1975-76, Wisconsin 1964-1972,]. For those aged above **cbage**, credit is equal to the sum of a percent of property tax above various percentage of income floors up to maximum credit **cbmaxcr1** (if **cbmaxcr1**>0). The percent of property tax falls from **cbpct1** to **cbpct2** between incomes **cbthresh1** and **cbthresh2**. Where **cbthresh5**>0, credit is eliminated when income rises above **cbthresh5**. The percentage of income floor is determined by a method similar to ordinary tax brackets, for example 0% of income below $500, plus 3% of income between $500 and $1,000, plus 6% of income between $1,000 and $1,500, etc. The brackets and rates are contained in **xb1-xb14** and **xr1-xr14**. Where **cbmaxcr2**>0, property tax above **cbmaxcr2** is set to equal **cbmaxcr2**. Percent of rent equivalent to property tax is **cbrenteq**.

13 – [Maine 1989-present] Credit for people at or above **cbage** works the same as *1*, except they can take the larger of that credit and the credit calculated for people under **cbage** described below.

The credit for people under **cbage** works as follows. Income must be less than or equal to **xcbthresh1** to qualify for credit. Maximum credit is **xcbmaxcr1.** Where **xcbmaxcr2**>0, property tax above **xcbmaxcr2** is set to equal **cbmaxr2**. No credit is received for property tax below **xcbfloor1** percent of income. For that portion of property tax which is more than **xcbfloor1** percent of income but less than or equal to **xcbfloor2** percent of income, credit is equal to **xcbpct1** percent of that portion of property tax. For that portion of property tax which is more than **xcbfloor2** percent of income, credit is equal **xcbpct2** percent of that portion of property tax. Percent of rent equivalent to property tax is **cbrenteq**.

14 – [Maryland 1979-present]. For both homeowners and renters, the credit is equal to property tax (or **cbrenteq** percent of rent for renters) in excess of a percentage of income floor. For renters, the floor is calculated similarly to *12* above, using bracket and rate structure in **xb1-xb6** and **xr1-xr6**. The brackets used to construct the floor for homeowners generally match up with those for renters, but the rates are sometimes lower for homeowners. For homeowners, **xcbthresh1-xcbthresh5** contain the amounts by which the rates for homeowners are lower than the rates for renters in each bracket. For homeowners, the rate in the first bracket is **xcbthresh1** lower than **xr1**, the rate in second bracket is **xcbthresh2** lower than **xr2**, and so forth, up through all five brackets. Starting in 2006 there are fewer brackets for homeowners than for renters, but this is addressed by setting the **xcbthresh** variables to get the rate right in each income range. The maximum credit is **cbmaxcr1** for rent and **cbmaxcr2** for property tax (if either is set to zero, then there is no limit). Percent of rent considered equivalent to property tax is **cbrenteq**. For homeowners there are no age restrictions (so **cbage** refers only to renters). For renters to qualify, they must either be **cbage,** *or* starting in 1993, they must have

at least one dependent child (**kids2** ≥ 1) *and* income must be below the poverty threshold from the year before income used to compute the credit was earned (so for example, we code the "2007" credit in year 2006, because that is when the income used to compute the credit was earned, and we use the 2005 poverty thresholds). Poverty thresholds are stored in the following variables for Maryland (threshold for single-person household is not needed because such households are ineligible for the credit).

Household size	2	3	4	5	6	7	8	9
Poverty threshold in variable:	**cbthresh2**	**cbthresh3**	**cbthresh4**	**cbthresh5**	**cbpct1**	**cbpct2**	**cbfloor1**	**cbfloor2**

Historical values for the official poverty thresholds can be found at: <http://www.census.gov/hhes/www/poverty/histpov/hstpov1.html> and <http://www.census.gov/hhes/www/poverty/threshld.html>.
For 1993-2007 we used the official thresholds (thresholds on the MD instructions involve some rounding, which we ignored). For homewoners, only **homeval** up to **cbmaxhome** is eligible for credit. If **cbfloor4** > 0, then the homeowner's property tax credit is only available to people with income below **cbfloor4**. [See Maryland Code, Tax – Property, Sections 9-102 and 9-104.]

15 – [Massachusetts] For people aged **cbage** or above, this works the same as *1*. In addition, there is available to all taxpayers an above-the-line deduction for **xcbpct1** percent of rent. If **xcbmaxr1**>0, the maximum available deduction is **xcbmaxcr1** (this is implemented in the program earlier, right after state itemized deductions).

16 – [Minnesota 1990-present].
Credit for property taxes and rent above a percentage of income floor, multiplied by a percentage, and subject to a maximum credit limit, all of which change with income. Parameters for homeowners are in the **cb** variables, and parameters for renters are in the **xcb** variables. For homeowners, credit works as follows. The percentage of income floor gradually rises from **cbfloor1** to **cbfloor2** percent of income, over the income range $0 to **cbthresh1** (that is, **cbthresh1** is the income level at which the maximum percentage of income floor kicks in). Taxpayers then get a credit equal to property taxes in excess of the percentage of income floor, multiplied by a percentage that gradually falls from **cbpct1** to **cbpct2** as income rises from $0 to **cbthresh2** (that is, **cbthresh2** is the income level at which minimum percentage kicks in). Note that the instructions and law report 100 – **cbpct1** and 100 – **cbpct2** (that is, the percentage of property tax above the percentage of income floor that the taxpayer must pay). In the law and tax instructions, **cbfloor** and **cbpct** percentages don't actually start declining until somewhere above $0 of

income, but our approximation starts the phase-down at $0 of income nonetheless. The credit is limited to a maximum amount that gradually declines from **cbmaxcr1** to **cbmaxcr2** between incomes **cbthresh3** and **cbthresh4**. No credit is allowed for people with incomes above **cbthresh4**. For renters, the variables beginning with **xcb** have exactly analogous meanings to the corresponding variables beginning with **cb**. In addition **xcbrenteq** indicates the percentage of rent that is considered equivalent to property taxes. Up through 1996, there was actually no percentage applied to rent to estimate property taxes; landlords were supposed to report the actual property tax payments on the apartment to the tenant. Since we don't have that data, we use 18 percent as a rough approximation. Also note that **cbincval1**, **cbincval2, cbfloor3**, and **cbfloor4** are used to compute the measure of income used to calculate the credit – see **cbincdef** = 8 below for details. The **cbmaxhome** and **cbmaxrent** variables are not used. Various parameters were indexed for inflation starting in 1994, and we estimated the inflation adjustments for the years between 1994-2006 (homeowners) and 1994-2005 (renters).

17 – [New Jersey]. This code allows for several distinct credits used in New Jersey.

First, for all filers there is available either a deduction on the income tax form equal to **cbincval1** percent of property tax, or a refundable credit of fixed value **cbincval2**. All property taxes above **cbmaxhome** are set to equal **cbmaxhome** for purposes of calculating the credit. The percent of rent equivalent to property tax is **xcbrenteq**. To qualify for the credit or the deduction, either **income** must be higher than **xcbthresh5**, or age must be 65 or above. The provisions above are addressed earlier in the program, in the sections on itemized deductions and miscellaneous credits, and are implemented regardless of the choice of value for **cbinclude**. This particular credit exists in NJ only starting in 1996.

Some filers may also qualify for one of the following two credits:

Credit for homeowners *after 2002*:

> Aged at or above **cbage**: credit is equal to the portion of property tax above **cbfloor1** percent of income, but the credit must be within minimum and maximum credit values. The minimum credit is equal to the fixed value determined below or **proptax**, whichever is less. Below income **cbthresh1**, the minimum credit is min(**cbmaxcr1,proptax**) and the maximum credit is **cbmaxcr2**. Between incomes **cbthresh1** and **cbthresh2**, minimum credit is min(**cbfloor2,proptax)** and maximum is **cbfloor3**. Between incomes **cbthresh2** and **cbthresh3**, the credit simply equals

min(**cbfloor4,proptax)**. Above income **cbthresh3,** credit is eliminated.

Aged below **cbage**: credit is equal to the portion of property tax above **cbfloor1** percent of income, but the credit must be within minimum and maximum credit values. Below income **cbthresh2**, minimum credit is min(**cbfloor2,proptax)** and maximum is **cbfloor3**. Between incomes **cbthresh2** and **cbthresh3**, the credit simply equals min(**cbfloor4,proptax)**. Above income **cbthresh3,** credit is eliminated.

Credit for homeowners *up to and including 2002*:

Aged at or above **cbage**: below income **cbthresh1**, credit is equal to the portion of the property tax above percent of income floor **cbfloor1,** subject to a minimum credit of min(**cbpct1, proptax**) and a maximum credit of **cbmaxcr1**. For income between **cbthresh1** and **cbthresh2**, the credit is min(**cbpct1, proptax**). For income between **cbthresh2** and **cbthresh3**, the credit is min(**cbpct2, proptax**). For those with incomes above **cbthresh3**, the credit is eliminated.

Aged below **cbage**: credit is equal to the minimum of property tax and **cbmaxcr2**. Above **cbthresh4**, credit is eliminated.

Credit for renters:

Aged at or above **cbage**: below income **xcbthresh1**, credit is equal to the portion of the property tax above percent of income floor **xcbfloor1**, plus fixed value **xcbfloor2**, up to a maximum credit of **xcbmaxcr1**, with a minimum credit of min(**xcbpct1, proptax**). For income between **xcbthresh1** and **xcbthresh2**, the credit is min(**xcbpct1, proptax**). For income between **xcbthresh2** and **xcbthresh3**, the credit is min(**xcbpct2, proptax**). For those with incomes above **xcbthresh3**, the credit is eliminated. Percent of rent equivalent to property tax is **xcbrenteq**.

Aged below **cbage**: credit is equal to the minimum of property tax and **xcbmaxcr2**. If income is above **xcbthresh4**, credit is eliminated.

18 – [New Mexico]. Works the same as *1*, except that **cbfloor1-3** are fixed values instead of percentages of income. The floor starts at **cbfloor1** and is phased-in in two possible stages; first it rises to **cbfloor2** starting at income **cbthresh3** and ending at income **cbthresh4**. Then it rises from

cbfloor2 to **cbfloor3** starting at income **cbthresh4** and ending at income **cbthresh5**.

19 – [Oregon 1973-present]. People aged above **cbage** can take the larger of the two credits computed below. Up until 1990, people aged under **cbage** were eligible to receive credit #2; afterwards they were not eligible for any credit.

1: Credit for rent only. Credit equals max(min(**rentpay**,**cbmaxrent**)-(**cbfloor1**/100)***cbincome**,0). Only those with income below **cbthresh1** qualify.

2: Credit is equal to property tax up to maximum **xcbmaxcr1** for **rentpay**>0 and **xcbmaxcr2** for **homeval**>0. The maxima are phased-out smoothly starting at income **xcbthresh1** and ending at income **xcbthresh2**. Percent of rent equivalent to property tax is **xcbrenteq**. (**cbmaxhome** and **cbmaxrent** do not apply).

20 – [Pennsylvania 1980-1990]. Works the same as *1* except that variables **cbthresh3-4** and **cbfloor1** do not determine percentages of income floor. Instead, they determine a fixed value received in addition to credit. Fixed value is equal to **cbfloor1** and is phased-out smoothly, starting at income **cbthresh3** and ending at income **cbthresh4**.

21 – [Rhode Island]. Works the same as *1*, except that if income is greater than **cbthresh4**, percentage of income floor is equal to **cbfloor3**. Note that in 2005 and earlier years, people under **cbage** were able to receive a a partial credit; the regular credit amount was multiplied by a ratio of the amount of funds left over from the amount appropriated after paying the elderly to the amount necessary to fully fund the credit for people under **cbage**. We have been unable to find any information on that ratio year-to-year, so through 2005, we assume that people under cbage receive no credit. Starting in 2006, the full credit is available to people of all ages (cbage = 0), so this is no longer an issue.

22 – [Utah 1982-present]. A percentage **cbpct1** of the portion of property tax is potentially eligible for credit. The maximum credit falls from **cbmaxcr1** to **cbmaxcr2** between incomes **cbthresh1** and **cbthresh2**. Credit is eliminated above **cbthresh2**. For renters, the same system applies in the **x-variables** except that the percentage of rent that is considered to be equivalent to property tax falls from **xcbrenteq** to **xcbpct1**, starting at income **xcbthresh1** and ending at income **xcbthresh2**.

23 – [Vermont 1973-present]. The credit is equal to the amount of property tax (or **cbrenteq** percent of rent) that exceeds a percentage of income floor, where the percentage is different depending on the bracket

into which one's income falls. We use the **xb** and **xr** variables to store the brackets and percentages. For people with income between **xb1** and **xb2**, the percentage is **xr1**; for people with income between **xb2** and **xb3**, the percentage ix **xr2**, etc. The total number of brackets is recorded in **xbracknum**. If **cbthresh1** > 0, then anyone with income above **cbthresh1** is ineligible; if **cbthresh1**=0, then people of all incomes are eligible. If **cbmaxcr1** > 0, then the maximum allowable credit is **cbmaxcr1**. If **cbmaxcr2** > 0, then the maximum credit (**cbmaxcr1**) is reduced by **cbpct2** percent of the amount by which income exceeds **cbmaxcr2**, so that the credit is completely eliminated at an income level of **cbmaxcr2** + **cbmaxcr1** / (**cbpct2** / 100). [As of 2008, credit computation was in Section 6066 of the Vermont Code, and limit (**cbmaxcr1**) was in Section 6067. In addition to the credit described here, there is now a "property tax adjustment" for people with incomes above **cbthresh1**, also described in Section 6066, which depends on one's locality and is related to school finance equalization. Since we do not have information on one's locality, we have not coded in that part of the property tax adjustment. There were also some years where payment of credits to people below a certain age was contingent on the budget situation; due to lack of information, we ignore this and assume all ages are eligible for the full credit.]

24 – [Wisconsin 1973-present]. Works the same as *1* except that in calculating the percent of income floor, first subtract **cbthresh3** from income (negative income set equal to zero).

25 – [Wyoming, 1975-present]. For people aged **cbage** or above, credit equals **cbpct1** percent of **proptax**, up to a maximum credit of **cbmaxcr1**. This credit is phased out between incomes **cbthresh1** and **cbthresh2**. This credit for the elderly has been in effect since 1975, and is currently in Section 39-11-109 of Wyoming code, and was previously in Sections 39-6-701 and 39-6-702. We have no information on how the credit worked 1975-1984; it is first described in ACIR in 1985, where it indicates the credit began in 1975. We currently assume the credit 1975-84 was the same as in 1985. People with assets, aside from their home, greater than a certain level are ineligible for this first credit, but we ignore this asset test.

In 1996-2002, for all ages, there is a second credit coded into the "**xcb**" variables (in Section 39-13-109(c) of the WY code, previously in Section 39-3-401). For people with income below the poverty threshold, the credit **xcbpct1** percent of property tax, up to a maximum credit of **xcbmaxcr1**. The percentage gradually phases down to **xcbpct2**, and the maximum credit gradually phases down to **xcbmaxcr2**, for incomes between the poverty threshold and **xcbfloor1** times the poverty threshold. If income is above **xcbthresh1** times the poverty threshold, then the taxpayer is ineligible for the credit. The poverty thresholds for each household size are stored in the "**xb**" variables, where **xb1** is the threshold

for a one-person household, **xb2** is the threshold for a two-person household, etc., through **xb9**, which is the threshold for a household with 9 or more people.

Starting in 2003, the **xcb** credit is now just **xcbpct1** of property taxes, and anyone with income below **xcbthresh1** is eligible; those with income above **xcbthresh1** are ineligible for the credit. This credit is still in Section 39-13-109(c) of the Wyoming code. The **xb** variables and other **xcb** variables are no longer used. In 2003-2006, **xcbthresh1** is 50% of the median household income for the state. In 2007, **xcbthresh1** is 2/3rds of the median household income for the state, and starting in 2008 **xcbthresh1** is 3/4ths of the median household income for the state. In all cases, **xcbthresh1** should actually be based on the larger of the median for state and for the county, but we simply use the state value. This credit also involves an asset test, and is limited to a maximum of one-half of the median residential property tax in the taxpayer's county; we ignore both of those complications due to lack of data.

Note that starting in 1997, there is an additional credit in Section 39-13-109(d) of the Wyoming code, that depends on assessed value of the home and local millage rate, and is only available to people who own homes with extremely small assessed values. We have ignored that credit because it seems more like a homestead exemption than a circuit-breaker credit, and because the data sets used with the calculator generally lack the information necessary to compute it.

26 – [Maryland 1977-78] Same as *12* above, but there is also a credit for those aged < **cbage**, equal to ½ of the credit for those >= **cbage**.

27 – [West Virginia 2003 - present]. Starting in 2003, there is a credit for the elderly coded into the "**cb**" variables. Eligible if age >= **cbage** and income is below 150% of federal poverty guideline, which is equal to **cbthresh1** + **cbthresh2***(household size - 1). Credit is equal to the property tax on the portion of **homeval** between **cbthresh3** and **cbthresh4**. Note that the instructions for the credit list the thresholds underlying **cbthresh3** and **cbthresh4** in terms of the *assessed* value of the home. As of 2007 the "assessed" value a home in WV was 60% of the market value – see for example: <http://www.wvaco.org/index.php?option=com_content&task=view&id=91&Itemid=54>. To find **cbthresh3** and **cbthresh4**, which are expressed in terms of market value, you need to divide the amounts reported in the instructions by 60%.

Starting in 2008, there is a new refundable credit for people of all ages coded into the **xcb** variables, and implemented through the income tax. The credit is equal to property taxes in excess of **xcbfloor1** percent of income, up to a maximum credit of **xcbmaxcr1**. Taxpayers may take the larger of this credit or the elderly credit described in the first paragraph, but not both.

28 – [California 1998 – present] Same as **cbtype** = 1, except the "**xcb**" variables do not refer to a credit available to those younger than **cbage**. Rather, the "**xcb**" variables are the parameters of a non-refundable renter's credit. If **proptax** = 0 and **rentpay** >0, there is a non-refundable credit of **xcbmaxcr1** regardless of age.

29 – [Minnesota, 1975-1976]. Credit is equal to property taxes in excess of a percentage of income floor. The **cb** variables are for those aged **cbage** or above, and the **xcb** variables are for those under age **cbage**. The percentage of income floor rises from **cbfloor1** to **cbfloor2** percent of income between incomes **cbthresh3** and **cbthresh4**. The maximum allowable credit declines from **cbmaxcr1** to **cbmaxcr2** between incomes **cbthresh1** and **cbthresh2**. Percentage of rent equivalent to property tax is in **cbrenteq**. Exactly analogous parameters applying to those under age **cbage** are in the **xcb** variables. (The fact that the maximum credit limits are $200 higher for the elderly is derived from ACIR).

30 – [Minnesota 1977-82]. For all ages, initial credit is calculated as 100% of property taxes (or **cbrenteq** percent of rent) above a percentage of income floor, up to an initial maximum credit limit. The percentage of income floor increases from **cbfloor1** percent of income to **cbfloor2** percent of income between incomes **cbthresh3** and **cbthresh4**. The initial maximum allowable credit declines from **cbmaxcr1** to **cbmaxcr2** between incomes **cbthresh1** and **cbthresh2**. To this amount, add additional credit equal to a percentage of property tax (or rent equivalent) in excess of the sum of the percentage of income floor and the initial maximum credit amount. For taxpayers aged **cbage** or above, the additional credit is calculated as follows. The applicable percentage is **cbpct1**, and the overall credit (sum of initial credit and additional credit) is limited to an amount that declines from **cbfloor3** to **cbfloor4** between incomes **xcbthresh3** and **xcbthresh4**. For taxpayers aged below **cbage**, the additional credit is calculated as follows. The applicable percentage is **xcbpct1**, and the overall credit (sum of initial credit and additional credit) is limited to an amount that declines from **xcbmaxcr1** to **xcbmaxcr2** between incomes **xcbthresh1** and **xcbthresh2**.

31 – [Minnesota, 1983-1984]. For all ages, initial credit is equal to property taxes (or **cbrenteq** percent of rent) in excess of a percentage of income floor, up to a maximum limit. The floor gradually increases from **cbfloor1** percent of income to **cbfloor2** percent of income between incomes **cbthresh3** and **cbthresh4**. The maximum initial credit is the smaller of an amount equal to the percentage of income floor, and a maximum limit that declines from **cbmaxcr1** to **cbmaxcr2** between incomes **cbthresh1** and **cbthresh2**. To this is added an additional credit that is a percentage of property tax and rent equivalent in excess of the

sum of the percentage of income floor and the maximum initial credit. The percentage declines from **cbpct1** to **cbpct2** between incomes **xcbthresh1** and **xcbthresh2** (for taxpayers aged below **cbage**) or between incomes **xcbthresh3** and **xcbthresh4** (for taxpayers aged **cbage** or above). The overall maximum credit (applied to the sum of the initial credit and the additional credit) is limited to an amount that declines from **xcbmaxcr1** to **xcbmaxcr2** between incomes **xcbfloor1** and **xcbfloor2**. No credit at all is allowed for anyone with an income above **xcbfloor2**. Note that we approximate **cbrenteq** to be 18%, because the law specifies that there was actually no percentage applied to rent to estimate property taxes; landlords were supposed to report the actual property tax payments on the apartment to the tenant, but we don't have data on that.

32 – [Minnesota, 1985-1989]. First, calculate the amount by which property taxes (or **cbrenteq** percent of rent) exceed a percentage of income floor. For those aged **cbage** and above, the floor increases from **cbfloor1** percent of income to **cbfloor2** percent of income between incomes **cbthresh3** and **cbthresh4**. For those aged under **cbage**, the floor increases from **xcbfloor1** to **xcbfloor2** between incomes **cbthresh3** and **cbthresh4** (note that **cbage** is zero except in 1987). Multiply the result by a percentage that declines from **cbpct1** to **cbpct2** between incomes **cbthresh1** and **cbthresh2**. The result is then limited to a maximum credit amount that declines from **cbmaxcr1** to **cbmaxcr2** between incomes **xcbthresh1** and **xcbthresh2**. Credit is zero if income is greater than **xcbthresh2**. Note that we approximate **cbrenteq** to be 18%, because the law specifies that there was actually no percentage applied to rent to estimate property taxes; landlords were supposed to report the actual property tax payments on the apartment to the tenant, but we don't have data on that. Also note that **cbincval1**, **cbincval2, cbfloor3**, and **cbfloor4** are used to compute the measure of income used to calculate the credit – see **cbincdef** = 8 below for details.

33 – (North Dakota, 1973 - present). First, there is a credit for elderly renters (aged **cbage** above) that is coded into the "**cb**" variables and works exactly the same as **cbtype**=1. Note, however, that this credit is not available to homeowners. In the same section of the law (57-02-08.1) there is also a "homestead credit" for elderly homeowners. However, the homestead credit is actually a reduction in the assessed value of the property for low-income elderly households for purposes of computing the property tax. As such, it is more like a homestead exemption, which we are not coding into the tax calculator (as it will generally already be reflected in the property tax liability data contained in any dataset used with the tax calculator). Finally, starting in 2007, there is a new credit called the "Residential and agricultural property income tax credit." This is a non-refundable credit against the income tax and is available to people of all ages. It is equal to **xcbpct1** percent of property tax up to a

maximum credit of **xcbmaxcr1**. The SAS program adds this new property tax credit into **gencred** and computes it regardless of the value of **cbinclude**.

201 – The **cb** and **xcb** variables are not used for circuit-breakers, but are instead used to store parameters used to compute a Louisiana tax that is a complicated function of federal tax liability. See **taxtype** = *fedtab*.

202 – The **cb** and **xcb** variables are not used for circuit-breakers, but are instead used to store parameters used to compute a Louisiana alternative maximum tax that is a complicated function of federal tax liability. See **xtaxtype** = *fedtab2*.

cbage Minimum age to qualify for circuit breaker credit (unless otherwise specified in **cbtype**).

cbref Is the circuit breaker credit refundable relative to the income tax?
0 – No.
1 – Yes.
2 – [Connecticut]. Circuit breaker credit for all ages is not refundable; circuit breaker credit for those at or above **cbage** is refundable (see **cbtype** *4*).

cbform Is the circuit breaker credit administered through the income tax? This variable, in conjunction with the value chosen for **cbinclude** by the user, determines which circuit breaker credits will be computed by the calculator.

0 – There is no circuit breaker credit.

1 – Credit is a line item on the income tax form.

2 – Credit is on a separate form or application not associated with the income tax, and is not incorporated directly into the property tax bill calculation.

3 – Credit is incorporated directly into the property tax bill calculation.

4 – [Connecticut 1997-present]. Circuit breaker credit for all ages is **cbform** *1*, circuit breaker credit for those at or above **cbage** is **cbform** *3* (see **cbtype** *5*).

5 – [Maryland 1981-present]. Circuit breaker credit for renters is **cbform** *2*, circuit breaker credit for homeowners is **cbform** *3* (see **cbtype** *14*).

6 – [New Jersey; Vermont 2006-present]. Circuit breaker credit for renters is **cbform** *1*, circuit breaker credit for homeowners is **cbform** *2*. In New Jersey, there is also an optional property tax deduction or credit is taken directly on income tax form (same as **cbform1**) – see **cbtype** = 17.

7 – [Vermont 1973-1996]. Circuit breaker is **cbform** *1* for people aged 65 and over. Otherwise it is **cbform** *2* (see **cbtype** *23*).

8 – [Vermont 2006-present]. Renter's credit is **cbform**=1, homeowner's credit is **cbform**=3.

9 – [North Dakota, 2007-present]. Renter's credit coded into **cb** variables is **cbform**=2. Property tax credit coded into **xcb** variables is **cbform**=1 (but this credit is computed as part of **gencred**, so it applies regardless of the value of **cbinclude**).

cbincdef Definition of income used to calculate circuit breaker credit (this income measure is called **cbincome**) in the program. Note when **income** is referenced in the descriptions below, the calculator actually uses the larger of the **income** variable from the input data set, or the sum of **individual** income components from the **input** data set, whichever is larger, in order to ensure that the broadest possible measure of income is being used.

0 – There is no circuit breaker credit.

1 – Broad measure of income (**income)** of both filer and spouse.

2 – [Arizona; Montana 1981-1983]. Broad measure of income (**income**) of both filer and spouse minus social security benefits.

3 – [Colorado, Iowa, Kansas 1997-2006, Maine 1990-present]. Broad measure of income (**income**) of both filer and spouse but capital losses are excluded (negative **othcg1** and **othcg2** set equal to zero).

4 – [Connecticut 1997-present]. Circuit breaker credit for all ages uses **cbincdef** *5*, circuit breaker credit for those at or above **cbage** uses **cbincdef** *1* (see **cbtype** *5*).

5 – [Hawaii, WV 2001-present, West Virginia 2003-2007]. Adjusted gross income of both filer and spouse.

6 – [Idaho]. Broad measure of income (**income)** of both filer and spouse minus capital gains (**ltcg1**, **ltcg2**, **othcg1**, **othcg2**) and medical expenses (**medexp**).

7 – [Wisconsin]. Broad measure of income (**income**) of both filer and spouse minus **cbincval1** for each dependent.

8 -- [Minnesota 1984-present]. Broad measure of income (**income**) minus the federal personal exemption amount if filer or spouse is aged 65 or over. Also subtract federal personal exemption amount times **cbincval1** for first dependent, times **cbincval2** for second dependent, times **cbfloor3** for third dependent and times **cbfloor4** for fourth dependent. Simply subtract the federal personal exemption amount for all further dependents. Finally, after 1988, capital losses are excluded (negative **othcg1** and **othcg2** set equal to zero).

9 – [Montana 1989–1996]. Broad measure of income (**income**) minus **cbincval1** or percent **cbincval2** of total retirement benefits (**pension1**, **pension2**, **ssben1**, **ssben2**), whichever is greater. Negative income is set equal to zero.

10 – [New Mexico, North Dakota]. Broad measure of income (**income**) of both filer and spouse minus medical expenses (**medexp**).

11 – [South Dakota]. Broad measure of income (**income**) of both filer and spouse minus **proptax** up to maximum deduction **cbincval1**.

12 – [Wisconsin 1977-1978]. Broad measure of income (**income**) of both filer and spouse minus **cbincval1** for every member of household aged 65 or above.

13 – [Pennsylvania 1999 -]. Broad measure of income (**income**) minus 50% of social security benefits.

14 -- [Massachusetts 2001 -]. Broad measure of income (**income**) of both filer and spouse minus **cbincval1** for each dependent and each taxpayer aged 65 or above.

15 – [Kansas, 2007 –]. Broad measure of income (**income**) minus 50% of social security benefits. In addition, capital losses are excluded (negative **othcg1** and **othcg2** set equal to zero).

16 – [West Virginia, 2007 -]. For the elderly credit coded into the **cb** variables, federal adjusted gross income is used to calculate the credit. For the property tax credit available to people of all ages coded into the **xcb** variables, it is federal adjusted gross income plus tax-exempt interest and untaxed social security benefits.

cbincval1 Dollar value involved in determination of income for circuit breaker credit. [Zero if not applicable].

cbincval2 Second value involved in determination of income for circuit breaker credit. [Zero if not applicable].

cbmaxhome Maximum home value subject to circuit breaker property tax credit.

0 – Not applicable.

1 – Circuit breaker does not apply to homeowners.

cbmaxrent Maximum rent subject to circuit breaker property tax credit. [Zero if not applicable]

Circuit breaker variables that (usually) apply to those at or above **cbage**

Note that the meaning of any of these variables may change depending on the value of **cbtype**. If a variable is used for something different than its usual meaning, that will be specified in the documentation for **cbtype**.

cbrenteq Usually, first percentage of rent that is considered to be equivalent to property tax. [Zero if not applicable]

cbmaxcr1 Usually, dollar value of maximum circuit breaker property tax credit. [Zero if not applicable]

cbmaxcr2 Usually, dollar value of second maximum circuit breaker property tax credit. [Zero if not applicable]

cbthresh1 Usually, first income threshold used in circuit breaker credit calculations.

cbthresh2 Usually, second income threshold used in circuit breaker credit calculations. [Zero if not applicable]

cbthresh3 Usually, third income threshold used in circuit breaker credit calculations. [Zero if not applicable]

cbthresh4 Usually, fourth income threshold used in circuit breaker credit calculations. [Zero if not applicable]

cbthresh5 Usually, fifth income threshold used in circuit breaker credit calculations. [Zero if not applicable]

cbpct1 Usually, first percentage of eligible property tax payments that may be taken as a circuit breaker credit. [Zero if not applicable]

cbpct2 Usually, second percentage eligible property tax payments that may be taken as a circuit breaker credit. [Zero if not applicable]

cbfloor1 Usually, first percentage of income (or fixed value) floor, below which property tax is not eligible to be taken as a circuit breaker credit. [Zero if not applicable]

cbfloor2 Usually, second percentage of income (or fixed value) floor, below which property tax is not eligible to be taken as a circuit breaker credit. [Zero if not applicable]

cbfloor3 Usually, third percentage of income (or fixed value) floor, below which property tax is not eligible to be taken as a circuit breaker credit. [Zero if not applicable]

Circuit breaker variables (usually) applying to those below **cbage**

Note that the meaning of any of these variables may change depending on the value of **cbtype**. If a variable is used for something different than its usual meaning, that will be specified in the documentation for **cbtype**.

xcbrenteq Usually, percentage of rent that is considered to be equivalent to property tax. [Zero if not applicable]

xcbmaxcr1 Usually, dollar value of maximum circuit breaker property tax credit. [Zero if not applicable]

xcbmacr2 Usually, dollar value of second maximum circuit breaker property tax credit. [Zero if not applicable]

xcbthresh1 Usually, first income threshold used in circuit breaker credit calculations. [Zero if not applicable]

xcbthresh2 Usually, second income threshold used in circuit breaker credit calculations. [Zero if not applicable]

xcbthresh3 Usually, third income threshold used in circuit breaker credit calculations. [Zero if not applicable]

xcbthresh4 Usually, fourth income threshold used in circuit breaker credit calculations. [Zero if not applicable]

xcbthresh5 Usually, fifth income threshold used in circuit breaker credit calculations. [Zero if not applicable]

xcbtpct1 Usually, first percentage of eligible property tax payments that may be

taken as a circuit breaker credit. [Zero if not applicable]

xcbpct2 Usually, second percentage eligible property tax payments that may be taken as a circuit breaker credit. [Zero if not applicable]

xcbfloor1 Usually, first percentage of income floor, below which property tax is not eligible to be taken as a circuit breaker credit. [Zero if not applicable]

xcbfloor2 Usually, second percentage of income floor, below which property tax is not eligible to be taken as a circuit breaker credit. [Zero if not applicable]

LOCAL INCOME TAXES

Local individual income tax estimates are only available for 1977 and later years, and only for the following states: Indiana, Kentucky, Maryland, Michigan, Missouri, New York, Ohio, and Pennsylvania. A few other states had extremely small individual income taxes during this period but are not modeled as such. The local individual income tax is approximated based on state and local revenue data from the Census of Governments. As of the latest revision of the calculator, data was not available yet for 2007, so for now the 2007 local tax parameters are assumed to be the same as for 2006. The coding allows for three types of local income tax approximation: (1) a tax that is a percentage of state tax liability; (2) a tax that is a percentage of income; and (3) a tax that is a percentage of earned income. The tax rate for each type of tax is: (1) local income tax revenues as a percentage of state income tax revenues; (2) local income tax revenues as a percentage of state personal income; and (3) local income tax revenues as a percentage of state personal income, divided by 0.75 (to approximate earned income as a share of total personal income). The New York local income tax applies in New York City only, and is the case where this approximation is probably the least accurate, since NYC has a rather complicated income tax. In this case, our approach at least roughly matches the progressivity of the NYC tax (since it is treated as a percentage of the NY state tax, which is progressive and has roughly similar features), and very roughly approximates the burden of the NYC tax multiplied by the probability that a randomly selected New Yorker is subject to it.

localtype Type of local individual income tax.

0 -- None.

1 -- Local tax = (**localrate**/100)*max(0, **taxs**).
IN, MD, MI, NY. Here, **taxs** is final state tax liability before subtracting off circuit-breaker credits.

2 – Local tax = (**localrate**/100)*(state taxable income). Ohio. Note that this is a likely to be bit off – since localrate is Ohio local income tax revenue divided by Ohio personal income, in a future revision we should

adjust localrate to reflect the fact that Ohio taxable income is probably smaller than Ohio personal income.

3 – Local tax = (**localrate**/100)*(earned income).
KY, MO, PA

localrate Rate of local individual income tax.

IX. DATA SET WITH FEDERAL TAX LAW PARAMETERS (IncTaxFed.dat)

All variables in IncTaxFed.dat have an "F" at the beginning of the variable name; any equivalent variable in IncTaxState.dat has the same name but with no "F" at the beginning (this does not apply to **Filertype**, which has an identical name in both data sets for purposes of merging SAS data sets in the calculator program). Cases where federal tax law variables have the same meaning and possible values as their counterparts in the state income tax data set are indicated with an asterisk (*) -- see the variable list for IncTaxState.dat for descriptions of these variables.

YEAR AND FILING STATUS

Fedyear Federal tax year
Note that starting in 1981, if 0.1 is appended to **fedyear**, then the associated data refers to the federal tax law that would have applied in that year if the most recent major federal tax reform had not been enacted. So for example, **fedyear** = 1987.1 refers to the federal tax law that would have applied in 1987 if the Tax Reform Act of 1986 had not been enacted. If 0.2 is appended to **fedyear**, that refers to the federal tax law that would have applied in that year if the most recent *two* major federal tax reforms had not been enacted, and if 0.3 is appended to **fedyear** that refers to the federal tax law that would have applied in that year if the most recent *three* major federal tax reforms had not been enacted. Federal tax reforms enacted in 1981, 1982 (changes to minimum tax and AMT), 1983 (social security), 1986, 1990, 1993, 1997, 2001, and 2003 are counted as major federal tax reforms. In general, this is done for the first three years after the tax reform is enacted. Check the federal tax parameter spreadsheet (IncTaxFed.xls) for details on when this is available.

Filertype Filing status
s -- Single
m -- Married
h -- Head of household

Fedkey Equals **Fedyear***100 + (1 if **Filertype**=”h”, 2 if **Filertype**=”m”, 3 if **Filertype**=”s”).

TYPE OF TAX

Ftaxtype Type of federal personal income tax
none -- No tax (prior to 1913), or no data available (after 2003).
fedinc -- Federal personal income tax in effect (1913 - present)

TREATMENT OF MARRIED COUPLES

Fmarded Deduction for married couple when both work
0 -- None
1 -- 1982 federal credit, 5% credit rate
2 -- 1983 federal credit, 10% credit rate

How it works:

EI = earned income = wages and salaries plus self-employment income from schedule C or F

NEI = net earned income = EI - employee business expenses and deductible retirement contributions

LNEI = lower-earning spouse's NEI

Deduction = .05*min(LNEI, 30000)

Fmultbrk Does federal income tax have multipe bracket structures for different filing statuses?
0 -- No (1913-1947)
1 -- Yes (1948-present)

EXCLUSIONS

Fcgexpct *
Fdivexpct *
Fdivexamt *
Fintexpct *
Fdiexamt *

Funemp Federal treatment of unemployment insurance
ui = gross unemployment compensation from input data set.
Possible values:

0 -- Not taxable (before 1979)

1 -- 1979-81 treatment. UI in AGI =
min{.5*max[(AGI not including UI) + UI -E, 0], UI},
where E = 20000 (s, h) or 25000 (m)

2 -- 1982-86 treatment. Same as above, but E = 12000 (s, h), or 18000 (m), and social security benefits excluded from definition of AGI used to calculate phase-out of exclusion.

3 -- UI is fully included in AGI (1987-2008, 2010 -)

4 – First $2,400 of UI is excluded from AGI, all UI above that level is included in AGI (2009).

Fssbentax Method of taxing social security benefits:
In formulae below, AGI includes everything in AGI except social security benefits.

0 -- Social security benefits are 100% excluded

1 – Method that applied 1984-1993.
Soc sec benefits included in AGI =
min((**Fssr1**/100)***ssben**, (**Fssr1**/100)*****(**Fagi**+(**Fssr1**/100)***ssben-Fssb1**))

2 – Method applying 1994-present.
Soc sec benefits included in AGI =
min((**Fssr2**/100)***ssben**,
(**Fssr2**/100)*****max(**Fagi**+**teint**+(**Fssr1**/100)***ssben-Fssb2**,0)
+min((**Fssr1**/100)*****ssben,(**Fssr1**/100)*****min((**Fssb2-Fssb1**),
max(0,**Fagi**+**teint**+(**Fssr1**/100)***ssben-Fssb1**))))

3 – 100% of social security benefits included in AGI (this has never applied).

Fssb1 First income threshold used in social security benefit taxation calculation. (For 1984-present, $25,000 for unmarried and $32,000 for married).

Fssb2 Second income threshold used in social security benefit taxation calculation. (For 1994-present, $34,000 for unmarried and $44,000 for married). Only applicable if **Fssbentax** = *2*.

Fssr1 First percentage rate used in social security benefit taxation calculation. (For 1984-present, 50%).

Fssr2 Second percentage rate used in social security benefit taxation calculation. (For 1994-present, 85%). Only applicable if **Fssbentax** = *2*.

EXEMPTIONS

Fexpercap *

Fexreturn *
Fex_dep *
Fex_age Value of extra federal exemption for age or blindness.
Fpctex *

Fexlim Federal phase-out of personal exemptions applicable 1987-present.
0 -- Not applicable.
1 – Exemption phase-out of 1987-90 applies.
2 – Exemption phase-out of 1991-present applies.
3 – Exemption phase-out same as 2 above, but amount of exemption lost is two-thirds of amount otherwise lost (applies 2006-7 under EGTRRA).
4 -- Exemption phase-out same as 2 above, but amount of exemption lost is one-third of amount otherwise lost (applies 2008-9 under EGTRRA).

Fminexlim AGI threshold at which phase-out of personal exemptions begins.

Fexlimrate Percentage rate used in personal exemption phase-out calculation
Led FDTXBASE = federal taxable income,
and EXEMPT = total value of exemptions before phase-out

5 -- Rate applicable from 1988-90.
If fdtxbase > **Fminexlim**, tax increase from phase-out =
min[.28*EXEMPT, (**Fexlimrate**/100)*(FDTXBASE-**Fminexlim**)]

0.0008 -- Rate applicable 1991-present.
If AGI > **Fminexlim**, Allowable exemption =
max[exempt-(AGI-**Fminexlim**)*(**Fexlimrate**/100)*exempt,0]

STANDARD DEDUCTION

Fminstded *
Fmaxstded *
Fminstded_d *
Fmaxstded_d *
Fminstded_a *
Fmaxstded_a Amount of increase in maximum standard deduction for each taxpayer or spouse aged 65 or over or blind (maximum of two increases). Applies 1987 and later years.
Fpctstded *
Fzba *

ITEMIZED DEDUCTIONS

Note: deductions for state and local property taxes and income taxes, and for casualty losses, were allowable continously since 1913, and the calculator takes this into account. Variables are provided only for major itemized deductions that changed at some point.

Fcharded Deduction for charitable contributions.
0 -- No deduction for charitable contributions.

1 -- Charitable deductions are deductible, but only for itemizers when there is a standard deduction or zero bracket amount.

2 -- Charity is deductible for itemizers. For non-itemizers, deduction is 0.25*min(100,charity). (1982-83).

3 -- Charity is deductible for itemizers. For non-itemizers, deduction is 0.25*min(300,charity). (1984).

4 -- Charity is deductible for itemizers. For non-itemizers, deduction is 0.5*charity. (1985).

5 -- Charity is deductible for itemizers. For non-itemizers, charity is also fully deductible. (1986).

Fchlim Maximum charitable deduction as a percentage of AGI.
The calculator now imposes this limit when it is binding. The calculator's detailed output files provides information on whether the limit was binding in the variable **Fchlimbind**. Note that the 50% of AGI limit for charitable deductions was temporarily suspended in 2005 for certain donations. The calculator currently deals with this by not imposing any % of AGI limit on charity if **Fchlim** is set to zero, as it is in 2005.

Fintded *

Fmedded Deduction for medical expenses, % of AGI floor
0 -- No deduction is allowed (1913-1943)
Number > 0 -- Percent of AGI floor (only expenses above the floor are deductible)

Fsaleded Are state and local sales taxes deductible?
0 -- No deduction is allowed (1913-1943, 1987-2003, 2005-)
1 – Yes (1944-1986)
2 – May choose between sales tax deduction and income tax deduction (2004-2007)

Fbusexded Are unreimbursed employee business expenses an itemized deduction?
0 -- No, unreimbursed employee business expenses are an adjustment (1913-86)

1 -- Yes, unreimbursed employee business expenses are an itemized deduction subject to 2% AGI floor along with miscellaneous deductions (1987-present)

Fmovexded Are moving expenses an itemized deduction?
0 -- No, moving expenses are an adjustment (1913-86, 1994-present)
1 -- Yes, moving expenses are an itemized deduction (1987-93)

Fcasdedlim Deduction for casualty losses, % of AGI floor
0 -- Casualty losses are an itemized deduction, and there is no % of AGI floor
Number > 0 -- Percent of AGI floor (only expenses above the floor are deductible). Equals 10 from 1983-present

Fidphthresh AGI threshold where limitation of itemized deductions begins. Applicable 1991-present.

Fidphrate Percentage phase-out rate applicable for itemized deductions. Applicable 1991-present.
Allowable itemized deductions = protected deductions + max[.2*(unprotected deductions), (unprotected deductions) - (**Fidphrate**/100)*(AGI - **Fidphthresh**)]
Note: under EGTRRA, this is phased-out gradually. In 2006 and 2007, the amount of itemized deductions lost is reduced to two-thirds what it would be otherwise. This is handled by setting **Fidphrate** = 2. The SAS code is written so that when **Fidphrate** = 2, no more than (2/3)*80% of itemized deductions can be lost. In 2008 and 2009, the amount of itemized deductions lost is reduced to one-third of what it would be otherwise. This is handled by setting **Fidphrate** = 1. The SAS code similarly interprets this as meaning that the maximum loss of itemized deductions cannot exceed (1/3)*30%.

BRACKETS AND RATES

Fbracknum *
Fb1-Fb55 *
Fr1-Fr55 *

INCOME AVERAGING
Applies 1964-1986.

How it works (approximately):

Let **avglaginc** = Annual average of lagged taxable income (previous 4 years from 1964-1983, previous 3 years from 1984-86), and TI = taxable income

If TI - **avglaginc** > max[(**Fincavg**/100)***avglaginc**, 3000],
then re-compute tax liability by applying the average tax rate that applies to the first 20% (25% starting in 1984) of the excess of TI over (1+(**Fincavg**/100))***avglaginc** in the ordinary tax to all of that excess.

Notes: from 1970-78, it appears that taxpayers had to choose between income averaging and alternative capital gains tax computation -- they could not use both. Prior to 1970, there were some complicated adjustments to the income averaging computation involving capital gains, but these are currently ignored by the program since we are unlikely to have sufficient information to compute the effects of income averaging provisions before 1970 anyway (because panel data does not exist for those years). In 1981, taxpayers could use income averaging and the alternative capital gains computation at the same time, and this is incorporated into the program.

Fincavg Does income averaging apply / percentage used in income averaging formula.

0 -- Income averaging does not apply (1913-1963, 1987-present)

Number > 0 -- Percentage by which current taxable income must exceed lagged taxable income for income averaging to apply (33.3% from 1964-1969, 20% from 1979-1983, 40% from 1984-86)

SPECIAL TAXES

Fsptx Type of special tax. For federal, this just includes alternative taxes on capital gains that involved only one tax rate (those with multiple rates required coding in the "extra" tax section)

cgmax1 -- Alternative maximum tax on capital gains. Pay smaller of regular tax, and regular tax recomputed without capital gains, plus **sptxrate** rate times capital gains.

cgmax2 -- Alternative maximum tax on capital gains, where any gains taxed below the maximum rate already continue to be taxed at those below-maximum rates. Any gains that would otherwise be taxed at a rate above **sptxrate** are taxed at **sptxrate**.

cgmax3 – Alternative maximum tax on capital gains that applied at the federal level 1972-78. Let TI = income, and T(.) be the ordinary tax

function which is defined by the regular bracket and rate structure. It works as follows:

If LTCG<=$50K:
tax liability = T(TI-(1-(**cgexpct**/100))***ltcg**) + (**sptxrate**/100)* (1-(**cgexpct**/100))***ltcg**).

If LTCG>$50K:
tax liability = T(TI-(1-(**cgexpct**/100))***ltcg**)
+ (**sptxrate**/100)*(1-(**cgexpct**/100))***sptxex**
+ [T(TI)-T(TI-(1-(**cgexpct**/100))*LTCG+(1-(**cgexpct**/100))***sptxex**)],

In this case, **sptxex** = 50000, and **sptxrate**=50.

Fsptxex *
Fsptxrate *

EXTRA FEDERAL INCOME TAX STRUCTURE

Fxtaxtype Type of extra federal tax
Note: there is no "base" variable for the extra federal tax, since base is automatically defined by the value of **Fxtaxtype**.

none – No extra tax is applicable.

paratax -- Parallel tax on some measure of income. In case of federal, this starts with gross income, then subtracts exclusions, deductions, and exemptions specified in rest of the variables for the tax. At the federal level, this applies to certain years between 1913-37 and 1943-45 when normal taxes and complicated surtaxes operated in tandem.

cgmax4 -- Alternative maximum tax on capital gains with multiple brackets. It works like **Fsptx** = *cgmax1* above, but with multiple brackets and rates applying to different amounts of capital gains. Maximum tax on amount of capital gains in second bracket is: min[**Fxr2***(LTCG-**Fxb1**), T(TI)-T(TI-.5**Fxb1**)], where T(.) is the ordinary tax function, TI is taxable income, and LTCG is long term capital gains.

cgmax5 -- Reduced tax rates on capital gains, applicable at federal level 1997-2002. Essentially, capital gains that would have been taxed under the first tax bracket (1997-2001) or the first two brackets (2002-) in the regular tax are taxed at **Fxr1** instead, and gains that would have been taxed in a higher bracket are taxed at **Fxr2**. The dollar amount of the dividing point between brackets is in **Fxb2**. Total tax liability = T(TI-

LTCG)+tax on capital gains, where T(.) is the ordinary tax function defined by brackets and rates, TI is taxable income, and LTCG is the measure of long-term gains subject to special treatment. Starting in 2001, **Fxr1** was lower if the asset had been held more than five years – the calculator consistently assumes that **ltcg** represents gains from the longest-term category. In addition, the 1997 legislation specified that assets bought in 2001 and later years and then subsequently held for five years would eventually be taxed at 18%, rather than the 20% reflected in **Fxr2**. The 2003 act obviated this feature before it began to apply, so we use the 20% top rate through 2002.

cgmax6 – 2003 – 2010. Same as *cgmax5*, but qualified dividends are now taxed like long-term capital gains.

Fxcgexpct *
Fxdivexpct *
Fxexreturn *
Fxex_dep *
Fxpctex *
Fxmaxstded *
Fxpctstded *
Fxcred_dep *

Fxintded * (Note: if **Fxintded**=1, then all other itemized deductions are the same as in the ordinary tax)
Fxbracknum *
Fxb1-Fxb3 *
Fxr1-Fxr3 *

MAXIMUM TAX ON EARNED INCOME

This was also called the "maximum tax on personal service income" in some years. It was applicable 1971-1981. How it works:

Before any adjustment for alternative capital gains computation:

EI (Earned income) = wages, salaries, Sch. C self-employment income, and 30% of net profits of a business where taxapayer contributed both capital and labor (which could include Sch. C, but need to check). Starting 1977, pension income becomes included in EI. Currently, calculator includes in EI for the purposes of this provision wages and salaries, all Sch. C self-employment income, and pension benefits where applicable. The 30% provision is currenlty ignored.

ED (Employment deductions) = employee business expenses and moving expenses.

ENI (Earned net income) = EI - ED

ELTCG = excluded long-term capital gains (50% excluded through 1978, 60% from 1979-86).

TPI = Tax preference items

1969-1975: TPI = ELTCG + excess investment interest + accelerated depreciation on low-income rental housing, real property, or personal property subject to a net lease + amortization of pollution control facilities or railroad rolling stock + stock options + bad debt reserves + depletion

1976: TPI = Same as above, plus "adjusted itemized deductions between 60% and 100% of AGI" are also a tax preference. Adjusted itemized deductions = total itemized dedcutions less medical & dental expenses and casualty losses.

1977-78: same as above, but $30,000 exemption removed, and pension income added to EI. Also, in 1978 only, excluded capital gains are no longer a tax preference item for purposes of the maximum tax.

1979-81: TPI = Same as 1978, except adjusted itemized deductions now exlcude state and local taxes as well.

TPIEX = exclusion for tax preference items ($30,000 1971-76 , $0 1977-81)

ETI = Earned taxable income = [(ENI / AGI)*TI] - (TPI - TPIEX)

TAX(.) = Normal tax rate bracket structure

MAXTAX(.) = Normal tax rate and bracket structure adjusted to set rates above the maximum to the maximum rate (60% in 1971, 50% after that, contained in **Fmaxeirate**).

TOI (tax on other income) = TAX(TI) - TAX(ETI).

OMAXTAXLIAB (ordinary maximum tax liability)
= MAXTAX(ETI) + TOI

Taking alternative capital gains computation into account:
Alternative capital gains computation applied through 1978 and in 1981. See **Fsptx** and **Fxtaxtype** for details on that.

ATCG = alternative tax on capital gains (note that 1972-78, ATCG is just the tax on the first $50,000 of LTCG before exclusion)

MAXTAXLIAB = Min{OMAXTAXLIAB, OMAXTAXLIAB - [TAX(TI) - TAX(TI - ELTCG)] + ATCG}

The maximum tax calculation is actually a lot more complicated than described above in 1981, because of complicated interactions with the alternative capital gains computation and the rate reduction credit. See calculator SAS code for details.

Fmaxeitype Type of maximum tax on earned income
0 -- None (1913-1970, 1982-present)
1 -- With alternative capital gains tax calculation and $30,000 preference exemption (1971-1975)
2 -- Same as 1, but with itemized deduction limitation (1976)
3 -- Same as 2, but pension benefits count as earned income, and $30,000 exemption for preference items removed (1977-78). Excluded capital gains no longer a tax preference item starting in 1978.
4 -- Same as 4, but alternative capital gains tax calculation is only relevant in 1981, and excluded capital gains and state and local taxes are no longer a preference item (1979-81)

Fmaxeirate Maximum tax rate on earned income (60% in 1971, 50% 1972-81)

MINIMUM TAX (A.K.A. "ADDITIONAL TAX FOR TAX PREFERENCES)

Applies 1970-1982.

How it works:
Minimum tax =
(**Fmintaxrate**/100)*max(0, TPI – max($10,000, .5*income tax after credits))
- unused credits for elderly, child care, political contributions, and energy
TPI = tax preference items, defined below.

Fmintaxtype Type of minimum tax. This is a tax on "tax preference items" (TPI). Definition of TPI includes:

0 -- 1913-1969, 1983-present: no minimum tax

1 -- 1970-1975: TPI = excluded LTCG + excess investment interest + accelerated depreciation on low-income rental housing, real property, or personal property subject to a net lease + amortization of pollution control facilities or railroad rolling stock + stock options + bad debt reserves + depletion

2 -- 1976-78: = Same as above, plus "adjusted itemized deductions between 60% and 100% of AGI" are also a tax preference. Adjusted

itemized deductions = total itemized dedcutions less medical & dental expenses and casualty losses.

3 -- 1979-82 = Same as above, minus excluded LTCG and preference itemized deductions (which are now in the AMT)

Fmintaxrate Percentage rate applied to tax preference income
0 -- 1913-1969, 1983-present
10 -- 1970-75
15 -- 1975-82

ALTERNATIVE MINIMUM TAX (AMT)

Calculator involves some approximations in calculating the AMT. For example, complicated interactions with credits are ignored. AMT is computed by subtracting ordinary tax liability (before credits) from tentative alternative minimum tax. Adjustments for things like the foreign tax credit are ignored. From its inception in 1979, the AMT could affect whether itemizing was advantageous or not, so from then on, itemization status for those potentially subject to the AMT is based on tax minimization rather than comparison between itemized deductions and standard deductions. Also note that it was possible for taxpayers subject to the alternative minimum tax to face a *negative* marginal tax rate on income. This would occur when tax credits (other than the foreign tax credit) were equal to or larger than ordinary tax liability, and the marginal rate in the AMT was below the marginal rate in the ordinary tax.

Famttype Type of alternative minimum tax.
Each value represents a different method for calculating the base for AMT. The descriptions of how the AMT works offered below are approximations reflecting the limited array of information supplied in the input data set. The different possible values for **Famttype** do not include changes in rates or exemptions, which are coded in separate variables (see below).

0 -- No AMT (1913-1978)

1 -- AMT base applicable in 1979-80, 1982.
AMTI (AMT taxable income) = AGI - exemptions - (deductions including ZBA) + ADJITEM + excluded capital gains.
ADJITEM = itemized deductions except medical, casualty, and tax, in excess of 60% of (AGI - allowable deductions).
TAMT = Bracket and rate schedule applied to (AMTI – Famtex).
AMT (AMT tax liability) =
max(0, TAMT - income tax after credits – mintax)

2 -- AMT base applicable in 1981.

AMTI is the same as in 1. Rates change. TAMT is now the minimum of TAMT under the old rates, or TAMT under the new rates but computed on (AMTI - excluded capital gains), plus a 20% tax on excluded capital gains. Thus the AMT may use either 1980 brackets or 1981 brackets under different circumstances (see above). Since 1981 brackets are the same as 1980 but with the top bracket lopped off, the 1980 brackets are coded in for 1981, and program appropriately accounts for this.

3 -- AMT base applicable in 1983-1986.
AMTI (AMT taxable income) = AGI - (allowable itemized deductions) + (excluded capital gains + dividend exclusion + other preference items).
Allowable itemized deductions that we can recover = charity + interest + medical(>10% of AGI, normally 5%) + casualty.
TAMT = Bracket and rate schedule applied to (AMTI – Famtex).
AMT = max(0, TAMT - income tax after credits)

4 -- AMT base applicable in 1987-90.
AMTI = TI + (standard deduction or disallowed itemized deductions) + (personal exemptions after phase-out) + (capital gain portion of contributions of appreciated property) + (adjustment to net operating loss deduction) + (other adjustments and tax preference items)
Disallowed itemized deductions = taxes + (medical expenses between 7.5% of AGI and 10% of AGI) + miscellaneous
TAMT = Bracket and rate schedule applied to [AMTI - (Famtex after phase-out)]
AMT = max(TAMT - income tax before credits, 0)

5 -- AMT base applicable in 1991-92.
Same as 4, except that itemized deductions lost to limitation are now subtracted from alternative minimum taxable income. In addition, capital gains on charitable contributions of appreciated tangible personal property were temporarily removed from AMT base for 1991 and 1992, but this change is currently ignored by the calculator. If a gift of appreciated assets is specified in the input data set in the **charcg** variable, it is assumed to be a gift of intangible property, and thus still subject to AMT in these years. So in effect, Famttype=5 is the same as Famttype=4 for purposes of the calculator.

6 -- AMT base applicable in 1993-96.
Same as 5, but capital gain on all charitable contributions now permanently removed from AMT base, which is reflected in the calculator. Also, itemized deductions lost to the limitation of itemized deductions for high-income households are now subtracted from AMTI (to avoid counting itemized deductions that are not actually deductible under the ordinary tax as preference items for the AMT). It appears from the tax forms that this last feature was not taken into account by the AMT in

1991-92, although this seems like such an obvious problem that I may just be missing how they fixed it in those years. There is also now an adjustment for carryovers of charitable contributions that exceed the 50% of AGI limit (to adjust for a different definition of AGI used by the AMT). This feature not taken into account by calculator.

7 -- AMT base applicable 1997-present.
Same as 6, but now TAMT = TAMT(AMTI - LTCG) + Tax on capital gains.
AMT = TAMT - income tax before credits
Starting in 2000, AMT is added to tax liability before credits, so that credits can now offset AMT liability.

Famtex	AMT exemption amount
Famtexth	AMT exemption phase-out threshold
Famtexrate	Cents of exemption lost per $ AMTI above threshold
Famtb1	bottom of 1st AMT bracket
Famtb2	bottom of 2nd AMT bracket
Famtb3	bottom of 3rd AMT bracket
Famtr1	1st AMT rate (%)
Famtr2	2nd AMT rate (%)
Famtr3	3rd AMT rate (%)
Famtbrkn	Number of brackets for AMT

GENERAL CREDITS

Fcrpercap *

CHILD TAX CREDIT
How it works:

If AGI < **Fkidcthresh**, then credit = **Fkidc*kids**.

If AGI > **Fkidcthresh**, then credit
= max[0, **Fkidc*kids** - (**Fkidcrate**/100)*(AGI-**Fkidcthresh**)].

Child credit is non-refundable through 2000. Starting in 2001:

If <3 kids, refundable child credit = min{**Fkidcrefrate***(EI - **Fkidcrefinc**), max[0, **Fkidc*kids** - (income tax after other non-refundable credits)]}

If 3 or more kids, refundable child credit = min{max[**Fkidcrefrate***(EI - **Fkidcrefinc**), (soc sec and medicare taxes - EIC)], max[0, **Fkidc*kids** - (income tax after other non-refundable credits)]}

Fkidc Amount of child tax credit per child

Fkidcthresh AGI threshold where phase-out of child tax credit begins

Fkidcrate Percentage phase-out rate, percent. Credit is reduced by (Fkidcrate/100) for every dollar of AGI above threshold.

Fkidcrefinc Income threshold above which child tax credit is refundable

Fkidcrefrate Percentage of earned income above Fkidcrefinc that becomes refundable child credit.

EARNED INCOME CREDIT
How it works:

Modified adjusted gross income (MAGI) = AGI (+ **teint** through year 1999)

Earned income (EI) is essentially wages and salaries plus self-employment income.

EIC(.) is the earned income credit as a function of income, defined by bend points and phase-in rates coded below.

If MAGI<=2nd kink, then EIC = EIC(EI)

If MAGI>2nd kink, then EIC = min[EIC(EI), EIC(AGI)]

Feicphin0 EIC phase-in rate, %, 0 kids

Feicphin1 EIC phase-in rate, %, 1 kid

Feicphin2 EIC phase-in rate, %, 2 or more kids

Feicphin3 EIC phase-in rate, %, 3 or more kids. If set to zero, **Feicphin2** is used. This is only relevant 2009-2010.

Feic1bend0 EIC 1st bend point, 0 kids

Feic1bend1 EIC 1st bend point, 1 kid

Feic1bend2 EIC 1st bend point, 2 or more kids

Feic2bend0 EIC 2nd bend point, 0 kids

Feic2bend1 EIC 2nd bend point, 1 kid

Feic2bend2 EIC 2nd bend point, 2 or more kids

Feicphout0 EIC phase-out rate, %, 0 kids

Feicphout1 EIC phase-out rate, %, 1 kid

Feicphout2 EIC phase-out rate, %, 2 or more kids

Feiclim0 Maximum MAGI to be eligible for EIC, 0 kids

Feiclim1 Maximum MAGI to be eligible for EIC, 1 kid

Feiclim2 Maximum MAGI to be eligible for EIC, 2 kids

Feiclim3 Maximum MAGI to be eligible for EIC, 3 kids (if set to zero, Feiclim2 is used). This is only relevant 2009-2010.

Feiciilim Maximum investment income allowed before taxpayer is disqualified from EIC (begins in 1996). For purposes of the tax calculator, investment income is defined as: [**int1** + **int2** + **teint1** + **teint2** + **div1** + **div2** + **ltcg1** + **ltcg2** + max(**rentinc1**,0) + max(**rentinc2**,0)]. The definition of investment income used in federal law is actually slightly more complicated than this, but this is the closest we can get with the available input variables.

SOCIAL SECURITY PAYROLL TAX

Information on social security payroll tax liability is currently only used to calculate itemized deductions for the few states that allow a deduction for the employee portion of payroll taxes. Note that taxpayers in the phase-in range for taxation of social security benefits could face very high marginal tax rates. For instance, over a certain part of the phase-in range in recent years, the effective marginal tax rate is 1.85 times the ordinary marginal tax rate.

Fssrate Federal social security (OASDI) payroll tax rate, combined employer-employee. (%)

Fsscap Maximum taxable earnings for OASDI payroll tax.

Fhirate Federal hospital insurance (Medicare) payroll tax rate, combined employer-employee. (%)

Fhicap Maximum taxable earnings for HI. Zero means no limit.

FssrateSE Federal OASDI payroll tax rate for self-employed

FhirateSE Federal HI payroll tax rate for self-employed

CREDIT FOR CHILD AND DEPENDENT CARE EXPENSES

In general, deduction, or expenditures eligible for credit, was limited to the earned income of the lower-earning spouse. Note that in cases where the maximum allowable credit was a step function of income, the calculator computes an approximation based on a linear phase-out.

Fkcaretype Type of provision for child and dependent care expenses

0 = none (prior to 1954)

1 = Itemized deduction (1954-1963). Maximum deduction was $600. For married couple, if AGI > $4,500, deduction reduced by $1 for each $1 of AGI above $4,500.

2 = Itemized deduction (1964-1971). Maximum deduction was $600 for one child or $900 for two or more. The deduction is phased out with income for married couples only; for single parents, there was no phase-out. For married couples, the full deduction is allowed if AGI<$6,000; deduction was then reduced by $1 for each $1 of AGI above $6,000.

3 = Itemized deduction (1972-1975). Maximum deduction was $2400 for one child, $3600 for 2, or $4800 for 3 or more. Deduction is phased out with income for all filing statuses. Full deduction available if AGI<$18,000; deduction reduced by 50 cents for each dollar of AGI above $18,000.

4 = Flat rate credit (1976-1981). Maximum eligible expenditures $2,000 for 1 kid, $4,000 for two or more. Credit rate is 20%.

5 = Flat rate credit (1982). Same as above, but maximum eligible expenditures increased to $2,400 and $4,800.

6 = Graduated rate credit (1983-2002). Same as above, but credit rate ranged from 30% for AGI below $10,000, to 20% for AGI above $28,000. Calculator approximates the phase-down of the credit rate with a smooth function.

7 = Graduated rate credit (2003-?). Maximum eligible expenditures rise to $3,000 for 1 kid and $6,000 for two or more kids. Credit rate now ranges from 35% for AGI below $15,000, to 20% for AGI above $43,000. Calculator approximates the phase-down of the credit rate with a smooth function.

CREDIT FOR ELDERLY AND DISABLED (A.K.A. RETIREMENT INCOME CREDIT)

Minimum age for eligibility is assumed to be 65 throughout. In some years, people below age 65 who had government employee pension income could also receive this credit -- we ignore this.

Feldctype Type of federal credit for elderly and disabled

1 -- Non-refundable credit = (Feldcrate/100)*{min[pen+div+int+rent, max[0, Feldcbase - nontaxssben - max(0, EI - Feldcex])]} -- separate calculation for each spouse. EI is earned income.

2 -- Same as 1, but half of labor income between Feldcex and Feldcex2 is excluded

3 -- Same as 2, but if over 65, spouses have the option of calculating separately using Feldcbase, or using Feldbase2, from which is subtracted the sum of their social security benefits and each spouse's labor income over his or her own exclusion.

4 -- If >= 65, non-refundable credit = (Feldcrate/100)*max[0, Feldcbase - nontaxssben - .5*max(0, AGI - Feldlcex)]. For joint returns: pool incomes, do a single calculation. Feldcbase applies if only one spouse >= 65, Feldcbase2 applies if both are >= 65.

Feldcbase "Base" (maximum amount of retirement income to which federal elderly credit can apply)

Feldcbase2 2nd "base" for calcualting federal elderly credit

Feldcrate % rate used in calculation of federal elderly credit

Feldcex Exclusion for labor income or AGI used in calculation of federal elderly credit.

Feldcex2 2nd exclusion for labor income or AGI used in calculation of federal elderly credit.

Feldcagefree If Feldcagefree>0, then people older than Feldcagefree have all labor income excluded from calculation of federal eldelry credit

MAKING WORK PAY TAX CREDIT

How it works: this is a refundable credit for each of taxpayer and spouse. For each, the credit is **Fmwpcrate** percent of earned income, up to a maximum credit of **Fmwpcmax**.

For those with AGI above **Fmwpcthresh,** the credit is reduced by **Fmwpcphase** percent of the amount by which AGI exceeds **Fmwpcthresh**, until it is completely phased out. Earned income is defined the same as for the earned income credit. There is also a refundable credit equal to **Fercred** that is given to each of taxpayer and spouse that receives social security benefits, railroad retirement benefits, SSI benefits, or veteran benefits. The making work pay credit is reduced by the amount of any **Fercred** payment. Since we have limited information, we give the credit to taxpayers or spouses that have **ssben** > 0 or are aged 65 or above. As of 2009, the making work pay credit only applies in 2009 and 2010, and **Fercred** only applies in 2009.

Fmwpcrate Phase-in rate for "making work pay" tax credit.

Fmwpcmax Maximum allowable "making work pay" credit. (For married returns, this is the maximum amount per spouse).

Fmwpcthresh AGI threshold above which the "making work pay" credit is phased out.

Fmwpcphase Phase-out rate for "making work pay" credit (percent).

Fercred Amount of "Economic Recovery Payment" to recipients of Social Security, SSI, Railroad Retirement and Veterans Disability Compensation Benefits, applicable in 2009. Due to limited information, the calculator only grants this to those aged 65 and above or with positive value for **ssben**.

FEDERAL NON-ITEMIZER DEDUCTION FOR PROPERTY TAXES

Fnipropmax Maximum allowable non-itemizer deduction for property taxes. Applies in 2008 and 2009. Non-itemizers are allowed a deduction for property taxes equal to min(**proptax**, **Fnipropmax**).

FEATURES OF FEDERAL LAW INCORPORATED INTO TAX CALCULATOR, BUT NOT REFLECTED IN FEDERAL TAX PARAMETER DATA SET

- Federal earned income credit, 1924-31 and 1934-43. This worked as follows.
    - Key variables:
        - Earned income (EI) = earned income (wages and salaries plus labor compensation portion of business and farm income).
        - Net income (NI) = total gross income minus itemized deductions.
        - Exemptions (EX) = total value of personal exemptions and dependent exemptions.
        - Deductions (DED) = itemized deductions "properly allocable to or chargeable against earned income," which mattered 1934-43. It is unclear what this means. Currently, calculator assumes these

deductions include unreimbursed employee business expenses, and state income taxes times labor income as a share of total gross income. The law provides no guidance, so we need to find the IRS regulation regarding this issue in the IRS Bulletin circa 1934.
        - Earned Net Income (ENI):
            - 1924: If NI <= $5,000, then ENI = NI. Else if EI > $5,000 then ENI = min[10000,max(5000,EI)].
            - 1925-27: If NI <= $5,000, then ENI = NI. Else if EI > $5,000 then ENI = min[20000,max(5000,EI)].
            - 1928-31: If NI <= $5,000, then ENI = NI. Else if EI > $5,000 then ENI = min[30000,max(5000,EI)].
            - 1934-43: If NI <= $3,000, then ENI = NI. Else if NI > $3,000 then ENI = min[14000,max(3000,EI-DED)].
    - How it worked:
        - 1924: Credit against tax = .25*min[NT(ENI-EX),NT(NI-EX)], where NT(.) is the "normal" tax function (graduated rates of 2%, 4%, and 6%).
        - 1925-31: Credit against tax = .25*min[NT(ENI-EX)+ST(ENI),NT(NI-EX)+ST(ENI)], where NT(.) it the "normal" tax function and ST(.) is the "surtax" tax function.
        - 1934-43: Credit against taxable income used to compute "normal" tax only = .1*min(ENI,NI).
    - Issues:
        - "Earned income" was defined to include wages and salaries plus labor portion of any sole-proprietorship, farm, or partnership income. In cases where both capital and labor were contributed, the labor portion would be considered not more than 20% of the net profit from the taxpayer's share of the trade or business. The calculator currently treats all sole-proprietorship and farm net income as labor compensation, and does not count any partnership income as such.

- 1940 "Defense tax" = .1*min(max(**fdtxliab_bc**,0),max(Fti+**Fexempt**-**fdtxliab_bc**,0)), where **fdtxliab_bc** is federal tax liability, **Fti** is federal taxable income, and **Fexempt** is the value of federal personal exemptions.

- 1943 "Victory Tax" and tax forgiveness.
    - Victory tax. In 1943, there was a one-year temporary "victory tax" that worked as followed. Victory tax taxable income was essentially gross income not including capital gains, less an exemption of $624 for an individual return or $1,248 for a joint return. Certain forms of U.S. federal government bond interest income were also exempt from the victory tax, but the calculator does not take this into account. Victory tax liability before credits (VicTax_bc) was then 5% of victory tax taxable income. A credit was then allowed against victory tax liability. The credit for single was min((.25+.02*deps)*VicTax_bc, 500+100*deps). The credit for head of household was min((.4+.02*(deps-1))*VicTax_bc, 1000+100*(deps-1)).The credit for married couples was

min((.40+.02*deps)*VicTax_bc, 1000+100*deps). Victory tax was further limited to be no greater than .9(net income) – income tax other than victory tax.

- Tax forgiveness. Withholding of income taxes on wages began at a 5% rate on January 1, 1943, and at a 20% rate on July 1, 1943. This created transition problems in both 1943 and 1944. In 1943, people had to pay their full 1942 tax bills, and then also had to pay withholding tax on their 1943 incomes. In 1944, people would have to pay the portion of their 1943 tax liabilities that had not already been paid in 1943 (a substantial portion, since full withholding did not start until mid-year 1943), and would concurrently have to pay withholding taxes on their 1944 incomes. To address this situation, the 1943 tax form (filed in spring 1944) allowed a refund of 75% of the smaller of 1942 or 1943 taxes, whichever was smaller (there was a 100% refund if the smaller of the two tax liabilities was less than 50%). In general, 1942 tax liability was usually smaller. Tax provisions were identical in 1942 and 1943, except that the victory tax and the medical and dental expense deduction applied in 1943 but not in 1942. To address this situation, for 1943 the tax calculator computes a 1942 tax liability assuming income and deductions were the same in 1943 as in 1942. It then reduces 1943 tax liability by 75% of the 1942 liability. This is done in a lump-sum fashion, so that it does not affect any marginal tax rate calculations.

- 1944-63 limitation on maximum effective federal average tax rate on federal taxable income. Rate limit was:
  1944-45: 90% of net income
  1946-47: 85.5% of net income
  1948-49: 77% of net income
  1950: 87% of net income
  1951: 87.2% of net income
  1952-53: 88% of net income
  1954-64: 87% of taxable income

- Credit for dividends, 1954-1964
  div = dividend income; Fdivexamt = dividend exclusion; Fti = federal taxable income. Credit is non-refundable.
  - 1954: credit applied to dividends received after July 31, 1954. This is approximated by multiplying dividend income for the year by (5/12).
    credit = min(.04*max(0,(5/12)*div – Fdivexamt), .02*Fti)
  - 1955-63: credit = min(.04*max(0,div – Fdivexamt), .04*Fti)
  - 1964: credit = min(.02*max(0,div – Fdivexamt), .02*Fti)

- Federal rules for allocation of deductions and exemptions prior to 1948
  - Adult exemptions for whole return can be divided in any way they choose; adult per capita exemptions and age exemptions must go to the adult to whom they relate; and dependent exemptions must be taken by the adult providing over half of support.

- From 1944-1947, separate filers could each get a $500 standard deduction (same as for singles). If one spouse itemized, both had to itemize.
- Each spouse claimed his or her own itemized deductions. So for instance, state taxes paid by each spouse were claimed by that spouse, charitable contributions made by a particular spouse were taken as deductions by that spouse, etc.

- "Recovery rebate" from Economic Stimulus Act of 2008.
  - Basic credit = min(net income tax liability, $600) if single or head of household, or min(net income tax liability, $1200) if married. "Net income tax liability" equals "regular tax liability" plus AMT minus nonrefundable credits (not including this one or the child credit).
  - The minimum basic credit is $300 if the taxpayer has either (1) "qualifying income" of at least $3,000, or (2) has both a net income tax liability of at least $1 and gross income greater than the basic standard deduction plus one personal exemption (or two personal exemptions if married).
  - If the taxpayer qualifies for any basic credit at all, then there is an additional $300 of credit for each child that qualifies for a child tax credit.
  - The overall credit is phased out above a threshold of $75,000 (or $150,000 if married). Subtract 5% of the amount by which AGI exceeds the threshold, until the credit is completely phased out.

X. DESCRIPTION OF RECENT CHANGES TO THE TAX CALCULATOR

This section describes changes implemented since December 2006.

December 2006

- An optional feature that roughly approximates local income tax liability for 1977-2004 was added.

- The optional deduction for state sales taxes was incorporated into the calculator at the federal level. Some states have begun to allow a similar deduction, but the calculator does not yet reflect this unless those states also allow a deduction for state income taxes.

February 2007

- Calculation of federal self-employment tax was corrected (thanks to Brad Heim).

- Calculation of Rhode Island earned income credit for recent years was corrected.

May 2007

- The date at which social security benefits became exempt in Georgia was corrected to 1988 (thanks to Jon Rork).

- The date at which social security benefits became subject to tax in Wisconsin was corrected to 1986 (thanks to Inna Shapiro and Dan Feenberg).

July 2007

- The treatment of medical expenses in AMT for 1991 and later years was corrected.

- The circuit-breaker credit calculation for **cbincdef**=13, which applied in Maine 1989-2004, was corrected (thanks to Hui Shan).

- Computation of the circuit-breaker credit for **cbtype**=22, which applied in Utah 1982-present, was corrected (thanks to Hui Shan).

September 2007

- The 2006 and 2007 federal income tax parameters were updated.

December 2007 - January 2008

- The method for determining federal and state itemization status was completely overhauled. There are many states where state itemization status is in some way

constrained by federal itemization status. For example, in some states, taxpayers are required to choose the same state itemization status as on the federal return. In these states, the choice of federal itemization status can have important consequences for state tax liability, and these consequences should be taken into account in the federal itemization decision. Similar issues arise in states where the state AMT (**mintaxtype**>0). The constraints on state itemization status were formerly ignored by the calculator, but information on these constraints is now included in the state variable **itemiz**, and the constraints are now imposed in the calculator. Given these complications, in order to accurately characterize optimal itemization status and marginal tax rates, and to avoid marginal tax rate notches, the tax calculator now always picks the combination of federal and state itemization statuses that minimizes combined federal-state tax liability, taking any constraints imposed on state itemization by federal itemization status into account. (Formerly, the program chose the federal itemization status that minimized federal tax liability, and the state itemization status that minimized state tax liability, without taking into account the impact of each decision on combined federal-state liability). Another change, intended to avoid "notches" that produce extreme values of marginal tax rates, is that now adding an increment to calculate marginal tax rates is not allowed to change itemization status. After adding the marginal tax rate increment, itemization status at each iteration is held at the same value it had in the corresponding iteration from before adding the marginal tax rate increment. See discussion of "itemization status" in section IV above for further details.

- In cases where variables calculated for the federal income tax affect state tax liability and vice versa, the number of iterations of the calculator used to compute federal and state tax liabilities was increased from three to four. As before, the marginal rate calculation repeats the complete set of (now four) iterations again after adding an increment to an input variable chosen by the user. I also expanded the set of conditions under which all four iterations are run. For example, cases where state itemization status is constrained by federal itemization status now lead to all four iterations.

- I inserted code directly into the program for translating SOI state codes into two-letter state postal abbreviations and vice versa, obviating the need for the old external file StateCross.dat.

- 2008 federal income tax parameters were updated. In addition, the AMT patch is now assumed to apply in 2007 but not in later years.

- The documentation has been edited in various places to improve clarity.

- The code for allocating state credits, minimum taxes, and itemized deductions across spouses who are filing separate state returns has been edited remove a bug that could cause very high marginal rates in rare cases.

- I corrected errors in the code for calculating the Wisconsin and Minnesota AMTs.

- I corrected the code for **lowtype** = 12 to compute the credit as a percentage of tax liability *before* minimum taxes (which is generally how it is computed). I also edited the code disallow the credit altogether in California if the taxpayer is subject to the state AMT (this is specifically written into the CA law). This corrects some rare illegitimate marginal rate notches.

- I modified the code for the federal earned income tax credit to disallow the credit for taxpayers with investment income above the allowable threshold (this feature was introduced into federal law starting in 1996).

- Kentucky had incorrectly been recorded as allowing an itemized deduction for state income taxes from 1985-2000, based on faulty information from *All States Tax Handbook*. A review of tax forms and the annotated statutes indicate that state income taxes were not deductible in Kentucky during this period -- only local income taxes were deductible. This has now been corrected.

- In Louisiana from 2000-2002, taxpayers were only allowed to deduct a fraction of their itemized deductions. In 2000 and 2001, taxpayers were effectively allowed to take a deduction equal to a standard deduction plus 50% of "excess itemized deductions" (the amount by which federal itemized deductions exceeded the federal standard deduction). In 2002, taxpayers were allowed a deduction equal to a standard deduction plus 57.5% of excess itemized deductions. This feature is now incorporated in the tax calculator via the **itemlim** variable. Itemized deductions were eliminated in Louisiana starting in 2003, but this had already been reflected in the calculator.

- I modified the code for state itemized deductions starting in 2004 to allow the federal deduction for state sales taxes in cases where the state already allowed a deduction for state income taxes (which is generally accurate), but to disallow state itemized deductions for state sales taxes otherwise (which is not always accurate). We know that in fact, some states with income taxes that did not allow state income taxes to be deducted did start to allow deductions for state sales taxes in 2004, but only if required one to choose the sales tax deduction on the federal return as well. The calculator currently ignores those situations because dealing with them appropriately would greatly increase the complexity and running time of the program, but would probably have little impact on accuracy. See documentation for **sitded** above for further discussion.

- I corrected the alternative maximum tax calculation that applied in North Dakota 1981-2000 (**sptx** = *maxpctfd*). This tax was a percentage of federal tax liability. The ND law specified the measure of federal tax liability used to compute this tax should include the alternative minimum tax, and the program has now been adjusted to reflect this.

- I added the Vermont alternative minimum tax that applied in 2001 only.

- I removed the two-earner couple deduction from the Minnesota state income tax for 1982-84. The historical notes to section 290.01 in the 1989 Minnesota Annotated Statutes make clear that this deduction was explicitly disallowed in 1982-84, and then was allowed starting in 1985.

- The code for determining federal itemization status was changed to take the non-itemizer charitable deduction into account. I also changed the variable **Fcharded** so that it takes on different values for different types of federal non-itemizer deduction.

- I added state charitable deductions for non-itemizers (see **charded**). The data regarding which states allowed non-itemizer deductions currently follows *Taxsim* (thanks to Dan Feenberg and Inna Shapiro).

- The code for the itemized deduction credit in Wisconsin was corrected to apply only to itemized deductions to the extent that they exceed the Wisconsin standard deduction.

- I changed code for **xtaxtype** = agicred so that the credit is computed as a percentage of tax liability before minimum taxes in California. Similarly, I changed the code for **miscextype** = 13 so that the credit is computed as a percentage of tax liability before minimum taxes in California. Both changes more accurately reflect the law, and also remove illegitimate marginal rate notches in rare situations.

- The true income range over which the Georgia low income credit (**lowtype**=2, 1971-1986) was phased out was so narrow that it led to marginal tax rates over 100%. The phase-out range has now been replaced with a "cliff" (the credit is eliminated if income goes above the threshold), because that way the "reverseMTR" feature of the tax calculator can now suppress the resulting marginal tax rate notch.

- I changed the code to only subtract *positive* amounts of federal income tax liability from state income when such a deduction is allowed, which is generally the rule.

- I removed the federal income tax deduction from "normal" North Dakota tax calculation for 2001 and later years (it is still present in the optional "extra" tax calculation).

- I coded in the maximum tax on personal service income that applied in New York from 1978 through 1986.

- Corrected the code for the 1979-1982 federal alternative minimum tax to define federal alternative minimum taxable income as federal taxable income minus the federal zero bracket amount, plus tax preference items. Formerly, the subtraction of federal zero bracket amount was incorrectly omitted. In addition, previously federal AGI less exemptions and the larger of itemized deductions and standard deductions

was used in place of taxable income -- this caused problems when calculations required calculating tax liability under both itemization statuses.

February 2008

- Corrected federal income averaging for 1984-86 to apply the average tax rate on the first *25%* (rather than 20%) of the excess of taxable income over 140% of **avglaginc** to all of that excess taxable income. The change from 20% to 25% occurred in 1984, but had not previously been incorporated into the calculator data. This percentage is directly in the SAS code, not part of the federal parameter data.

- Modified the code for federal income averaging in 1981 to allow taxpayers to take advantage of income averaging and the alternative capital gains computation at the same time.

- Added three variables to the input data set: **blind**, **psincome** and **psded**. The **blind** variable indicates whether the taxpayer and/or spouse are blind, and is used to calculate federal exemptions or federal additional standard deductions allowable to such taxpayers. The calculator does not yet model state tax treatment of blindness. The **psincome** and **psded** variables are included to allow for more accurate computations of the federal maximum tax on personal service income (earned income) that applied at the federal level 1971-1981. The information necessary to compute these two variables is generally available in IRS statistics of income data from those years.

- Changed code to allow the **oamtadj** in the input data set, which was not otherwise being used in 1981, to store the value of capital gains realized in 1981 after June 9th (which are subject to a maximum rate of 20% that year).

- When computing the second-earner deduction that applied at the federal level 1982-86, the calculator now assumes all business expenses are associated with the higher-earning spouse. This makes it easier to back out earned income of spouse from data that provides information on the amount of the second-earner deduction, while keeping the second-earner deduction computed by the calculator consistent with what is in the data.

- Modified the NY maximum tax on personal service income to make use of the **psincome** and **psded** variables, when available.

March 2008

- Modified the calculator so that if **incrementquantity** = 0, the calculator will not go through the iterations required to calculate marginal income tax rates.

- Modified the **fedyear** variable so that it is possible to apply federal tax law that would have applied in the absence of recent major tax reforms in certain years starting with 1981.

- Fixed the code for implementing **taxnodetail**, which is used when the taxpayer input data does not provide information on how state and local tax deductions are divided up among different types of taxes. Previously, whenever **taxnodetail** was greater than zero, the calculator would produce nonsensical marginal rates. This problem has been corrected. Correcting it required, among other things, running two extra iterations of the tax calculator when **taxnodetail** > 0. I tested the new code on the 1979-1990 public use tax panel, by running the calculator once on the data with **proptax** and **salestax** set to their values in the original data and **taxnodetail** set to zero, then and once where **taxnodetail** was set equal to **proptax** + **salestax** + (**taxs** from the first run of the calculator). Marginal tax rates and tax liabilities were identical in the two runs.

- Changed the calculator code to start imposing limits on charitable deductions as a percentage of AGI at both the federal and state levels. Also added two variables to the detailed output data set, **Fchlimbind** and **chlimbind**, which indicate whether the limit was binding.

- Changed the SAS code for the California AMT to reflect the fact that built-in capital gains on charitable donations of appreciated assets are no longer included in the AMT base starting in 2002.

- In 1991-92, only built-in capital gains on charitable donations of intangible property (e.g., stocks) were subject to the federal AMT. Previously, the calculator did not include **charcg** in the federal AMT base in 1991-92, essentially assuming that such gifts were tangible property. This has now been changed, so that **charcg** is assumed to be intangible property, and thus subject to AMT in those years.

- Made minor corrections to the computation of the "adjusted itemized deductions" preference in the computation of federal maximum tax, minimum tax, and AMT 1976-82.

- Removed excluded capital gains as a tax preference item for purposes of calculating the federal maximum tax on personal service income in 1978.

- Added federal zero bracket amount to detailed output data set

- Corrected the AMT treatment of medical expenses 1987-90. Only medical expenses less than 10% of AGI are disallowed by the AMT in these years; calculator had previously incorrectly disallowed all medical expenses in the AMT during those years.

- For long-term capital gains realized in 1981, modified the code to calculate the marginal rate assuming gains were realized after June 9 in all cases.

- Changed AMT calculation for 1981 to only apply 20% rate to capital gains realized after June 9, 1981 when information on that is available.

- From 1983-1986, the deduction for second earner income was 10% of spouse's income up to $30,000. The calculator data previously had 5% in these years. This has now been corrected.

- Changed the code for the 1981 federal rate reduction credit. Previously, it was coded as a 0.0125 percentage point reduction in each tax rate. But in fact, it was a credit equal to 0.0125% of tax liability, and the rates were left intact at the same levels as in 1980. In addition to this being a different size tax reduction, the fact that the rates were left intact is important for purposes of computing the maximum tax on personal service income and income averaging. In the case of income averaging, the credit is effectively recomputed as 0.0125% of income averaging tax liability. In the alternative capital gains computation, the credit is 0.0125% of tax liability computed on taxable income excluding post-June 9 capital gains. The application of the rate reduction credit is very complicated in the maximum tax on personal service income -- see SAS code for details.

- Revised the code for the maximum tax on personal service income in 1981 to properly account for the alternative capital gains computation and the rate reduction credit.

- Corrected the federal AMT calculation to subtract itemized deductions lost to limitation from alternative minimum taxable income in the years 1991-1992.

May 2008

- Removed the 50% of AGI limitation for charitable deduction for fedyear=2005.

- Fixed casualty loss deduction to disallow $100 of losses (in addition to 10% of AGI, where applicable).

- Created coding scheme for new extra dependent exemption in Alabama starting in 2007 (see **lowtype** = 24).

- Modified code for Arkansas low-income tax table to reflect changes implemented in 2007 (see **xtaxtype** = *lowtab2*).

July 2008

- Corrected Maryland circuit breaker credit calculation to remove the age restriction for homeowners starting in 1979 (the age restriction continues to apply to renters).

- Corrected value of **conform** to equal 2 in Maryland since 1967 (now **othadsaf** = 1, after **othadjsaf** replaced **conform**).

- Corrected the Montana standard deduction for head of household for all years from 1985 on, and corrected the standard deduction parameters to include the minimum standard deduction that was introduced in 1996.

- Corrected value of **zba** for Louisiana 1985, 1987, and 1989.

- Corrected **miscextype** and **miscexamt** for Massachusetts, 1984-86.

- Corrected **ex_dep** for Massachusetts, 1979.

- Corrected values of **retph1** and **retph2** for heads of household in New Mexico 1985-86.

- Corrected **xbracknum** for New York in 1980 (number of brackets for state maximum tax on personal service income).

August 2008

- Corrected tax rates in Massachusetts, 1985 (7.5% surtax was still in effect).

- Corrected Montana standard deduction for 1981.

- Corrected **cbthresh3** and **cbthresh4** for Montana 1981 - 1989.

- Corrected **cbincdef** for Montana 1981 - 1983.

- Corrected **cbmaxcr1** for Montana 1981-1982.

- Corrected Illinois earned income credit to make it refundable starting in 2003.

- Corrected value for **itemiz** in Maryland for 1987.

- Corrected values of various circuit breaker variables for Maryland 1979-89.

- Corrected value of **multbrk** for South Carolina 1987 - 1988.

- Corrected some details of Maine minimum tax starting in 2003, and added new code for it. See **mintaxtype** = 9.

- Corrected federal income tax deductibility for South Carolina 1985 and 1986.

- Added retirement income credit (that was a percentage of the federal version) in Nebraska 1981-85.

- For Tennessee, corrected values of **exreturn** and **retex** variables in 1986, and corrected values of **retex** variables for 1979.

September 2008

- Created new code for Kentucky family size credit instituted in 2005 (see **xtaxtype** = liabcred2).

- Corrected phase-out income range for New York household credit from 1986 on.

- Corrected phase-out income range for New York child care expense credit from 2001 on.

- The descriptions of **miscextype**=15 and **miscextype**=16 had been reversed in the documentation. Also **miscextype**=12 and **miscextype**=15 had been miscoded in the SAS code. These problems have been corrected. (Affected KS, IN, and VA).

- Created new code for new "Empire State Child Credit" in NY. This is a child credit that is a function of the federal credit, instituted in 2006. See **sptx** = kidcred.

- Created new code for phase-out of the benefits of marginal tax rates below the top rate. This was instituted in NY starting in 2006. (See **sptx2** = surtax).

- Created new code for NM low-income exemption that was instituted in 2006. See **xtaxtype** = lowexempt.

- Created code for new VA EITC, instituted starting in 2006. See **eicstypestate** = 7.

- Updated state tax parameter data through 2007.

January – February 2009

- Fixed a bug in the calculation of **liabtax** and **liabcred** (affecting KY 1956-1960 and CA in 1969).

- Modified IncTaxCalc.sas to allow it to send SAS log file to an external file, IncTaxCalc.log, which is saved in the *outputpath* directory specified by the user.

- Corrected a mistake in the code for the 1940 federal "defense" tax.

- Incorporated low-income credits and retirement income credits for Vermont 1969-1993 into SAS code.

- Fixed SAS code for state income taxes that are a percentage of federal tax liability, to allow for refundable tax credits where appropriate.

- Corrected an error in the calculation of Vermont's "special tax limitation schedule" (**sptx** = "vtmax"), 1969-73. The error had been introduced in the January 2008 edits, which had allowed for situations where state law limits choice of state itemization status in some way that depends on federal itemization status.

- Modified computation of Arkansas low-income tax table (**xtaxtype** = lowtab1) 1973-1990, in order to reduce likelihood of large marginal tax rate notches.

- Corrected 1948-1969 federal alternative capital gains tax calculation to remove effects of special rate reduction credit that only applied in 1981.

- Corrected federal dividend credit calculation for 1954-57 so that when alternative capital gains tax calculation applies, credit cannot exceed 4% (or 2% in 1954) of taxable income excluding capital gains. Note that in 1958-1964, this provision was removed from the law, so that the maximum credit was once again 4% (or 2% in 1964) of taxable income. In cases where the taxpayer had large capital gains but zero or negative taxable income aside from capital gains, this could lead to small negative marginal tax rates on non-capital gains income, and small positive marginal tax rates on itemized deductions. Those odd marginal tax rates are a legitimate outcome of the tax law.

- Corrected SAS code for calculation of federal retirement income credit 1965-1975 (**Feldcred**=3). The method for calculating the phase-out of the credit for married couples had been slightly off.

- Modified the **reverseMTR** option so that it addresses notches in **mtrfns**. The program now recalculates marginal tax rate after subtracting an increment from **mtrvar** not only when overall marginal tax rate (**mtr**) exceeds the value of **checkMTR**, but also when federal marginal tax rate calculated setting state income tax to zero (**mtrfns)** exceeds the value of **checkMTR**. It then chooses the set of marginal rates that minimizes the maximum of the absolute values of **mtr** and **mtrfns**.

- Fixed parameters of New York maximum tax on earned income, 1985 and 1986.

May 2009

- Replaced the old state tax **conform** variable with a new variable **othadjsaf.** Both variables serve the similar purpose (indicating whether a state income tax generally

allows similar adjustments to the federal income tax), the change just simplifies the coding scheme and renames the variable.

June – August 2009

- Updated calculator to reflect changes in federal income tax up through June of 2009.

- Corrected calculation of 2007 standard deduction for Alabama, and clarified coding scheme for phase-outs of standard deductions in documentation.

- Changed coding scheme for Connecticut exemption phase-out (1992 – present) to remove it from the bracket and rate structure (**b1**-**b26** and **r1**-**r26**) and hard code it using **exlim** = 3.

- Made minor correction to calculation of alternative tax on capital gains in Hawaii 1991-1998 and 2002-present (see **sptx** = cgmax2).

- Corrected the standard deduction for married couples filing separately in Iowa for 1979 – present (see **mardedtype** = 9).

- Corrected Louisiana credit for child and dependent care expenses 1986 – present (see **kidcaretype** = 15 and **kidcaretype** = 16).

- Incorporated Maryland child care credit that began in 2000 but which we had previously missed (see **kidcaretype** = 28).

- For Massachusetts 1996 – present, made major correction to taxation of **othcg**, and minor corrections to taxation of dividends, interest, and **ltcg**. See **sptx** = diothcgtax, masstax; and **sptx2** = ltcgtax.

- Modified code for **cgexpct** so that if **cgexpct** = 100, then it applies to **ltcg** + **othcg**, not just **ltcg**. This is generally correct.

- Made a minor correction to the calculation of the Missouri pension exclusion for married couples, 1997 – present.

- Corrected phase-outs of retirement income deductions in MN (1978-84) and TN (1976-1999).

- Corrected limit in deduction for federal income taxes in Montana for married couples, 2005-2007.

- Corrected federal deduction for child care expenses 1972-75 so that phase-out applies to all filing statuses, not just married.

- Corrected calculation of deduction for child care expenses in Montana, 1955-present.

- Incorporated new two-earner couple deduction that was introduced in North Dakota starting in 2007 (see **mardedtype** = 10).

- Corrected calculation of deduction for federal income taxes in Arizona 1987-1989. See **limfdtype** = 5.

- Coded in non-itemizer charitable deduction that applied in Colorado 2001 and 2006-2008 (see **charded** = 5).

- Coded in "credit for general income tax" for Hawaii, 2007 (see **xtaxtype** = lowcred).

- Corrected refundablity of IL EIC for 2003-2006 (see **eictypestate** = 8).

- Corrected Iowa "alternative tax computation" (**xtaxtype** = maxtax) so that it does not apply to single filers, only married and head of household, 1988-2008. Corrected treatment of separate filers by this Iowa alternative tax, 1988-2008. Corrected no-tax floor (**lowtype** = 14) to apply in Iowa for all filing statuses 1988-2008.

- Made a variety of corrections to property tax credit for Maryland, 1979-present.

- Incorporated a new Montana property tax credit (introduced in 2007) into the code for **cbtype** = 6.

- Incorporated non-refundable credit for 5% of property tax in Illinois income tax, 1991 – present (see **cbtype** = 8).

- Corrected income thresholds for eligibility for Oklahoma sales tax credit starting in 2005, and parameterized the thresholds (see **miscextype** = 8 and **sptx** = misc8).

- Corrected retirement income exclusions in Utah, 1987-2007, to include taxable social security benefits in the measure of retirement income. Also corrected the phase-out calculation for these exclusions so that the income measure used to compute the phase-out included tax-exempt interest starting in 1994. See **retextype** = 17 and **miscextype** = 5 and 6.

- Made various minor corrections to calculation of Virginia age deductions (**retextype** = 18 and **miscextype** = 17), 2004-2007.

- Minor corrections to calculation of exclusion of labor income for low-income taxpayers, MD 1989-1997 (see **lowtype** = 10).

- Made minor correction to tax rates in Colorado 1979-1981.

- Various corrections to Minnesota circuit breaker credit, 1975-present. See **cbtype** = 16 and **cbtype** 29 through 32.

- For Minnesota: corrected value of standard deduction in 1983, 1984, 1986; corrected parameters of child care tax credit 1984-1989; corrected credits and standard deduction in alternative maximum tax, 1985; corrected value of **retph1** 1985-1986, all **retex** variables in 1987, and **pctfeldcr** in 1987.

- Corrected parameters of NY circuit breaker credit, 1979-1984.

- Corrected timing of introduction of NY retirement income exclusion (it started in 1982, not 1981).

- Coded in NY minimum standard deduction, 1972-1984, and corrected all NY standard deduction values for 1977.

- Ohio, 1983-1988, allowed choice between extra $350 per capita exemption or $20 per capita credit. Calculator previously assumed everyone took exemption. See **lowtype**=27.

- Corrected brackets and rates used to compute credit for married couples in Ohio 1984-1988 (**mardedtype** = 7).

- Corrected values of **cbthresh1** and **cbthresh2** in OK 1979 and 1984-1987.

- Corrected values of **xexpercap** and **xex_age** in OK 1982-2005.

- Corrected value of **pctfdeldcr** in OR 1987-1988.

- Coded in "alternative flat tax" introduced in RI in 2006 (see **sptx** = maxtax).

- Corrected value of **xcbthresh1** in ME 2006.

- Corrected value of **kc1** in GA 1980-86.

- Corrected value of **cbmaxcr2** for Hawaii 1981-2004.

- Corrected value of **r1** in Idaho 1979.

- Corrected value of **xcbmaxcr2** in Indiana 1998.

- Corrected tax rates in Iowa, 1989.

- Corrected values of **kc2** and **kc4** in Iowa, 1990-1992.

- Corrected value of **cbage** in Iowa, 1992.

- Corrected value of standard deduction in Kansas 1998-2000.

- Corrected **r1** for married couples in Kansas 1988 and 1995-1997.
- Corrected value of **exreturn** in NH, 1997-1998.
- Corrected value of **kc5** in NY 1997-1998.
- Corrected Ohio child care credit 1993-1996.
- Ohio 1996-1998: addressed the fact that personal exemptions were larger for dependents than for taxpayer and spouse in these years by coding the extra exemption amount for dependents into **ex_dep**.
- Corrected **crreturn** in AR 2005-2007.
- In CA, corrected **b2** for married in 2006, **b3** for head of household in 2007, **kc4** in 2005, **cred_age** in 2006, and **crreturn** for married in 2006-2007.
- In CT, corrected **xcbthresh2** for singles in 2007.
- In DC, corrected **r3** in 2005.
- In ID, corrected **cbform** in Idaho 2004-2007, and corrected tax brackets for 2007.
- In NE, corrected **xosa1st** 1993-present.
- In NM, coded in 2005 income tax rebate (see **xtaxtype** = nmrebate).
- In NV, corrected value of **cbthresh1**, 2003-2007.
- Corrected code for choosing between property tax deduction and credit in NJ (see **cbtype** = 17) so that the choice is held constant when adding increment to calculate marginal tax rates (in order to avoid marginal tax rate notches).
- Coding scheme for Vermont circuit-breaker (1973-present) was re-organized, and various corrections were made. See revised documentation for **cbtype** = 23.
- Coding scheme for North Dakota circuit-breaker (1973-present) was re-organized, and the new property tax credit added in 2007 was coded in. See **cbtype** = 33.
- Made various corrections to Wyoming circuit-breaker credits, 1975-present. See **cbtype** = 25.
- Revised the coding scheme for Arkansas low income tax tables, 1991-present (see **xtaxtype** = lowtab2 and lowtab3). The tax calculator now more accurately

characterizes how these special tables work, including the non-linear aspects, and reflects the changes enacted in 2007.

- Corrected calculation of deduction for federal income taxes in Oklahoma, 1975-1978. See **limfdtype** = 2.

- Revised code for Kentucky Family Size Tax Credit (**xtaxtype** = liabcred2) to correct treatment of married couples filing separately.

- Modified code for low-income credits in Pennsylvania and California to eliminate smoothing of the phase-out of the credit. This avoids extremely high marginal tax rates as long as **reverseMTR** is set equal to 1. See **lowtype**=12.

- Changed exclusion for capital gains (**cgexpct)** to from 60% to 0% in Arizona, 1987 and 1988. Arizona Session Laws of 1988, Chapter 271, amending sections 43-104, 43-1021, and 43-1022 make clear that references to the Internal Revenue Code had already been updated to reflect TRA86 in 1987, and that nothing in 43-1021 or 43-1022 undid the elimination of the 60% exclusion.

- Changed maximum tax rate on capital gains from 7.5% to 7.25% in Hawaii, 1987-2001 (**sptx** = cgmax2) – verified using 1988, 1993, and 2000 HI Annotated Statutes.

- Changed capital gains exclusion (cgexpct) for Kentucky in 1990 from 60% to 0%. 1990 Kentucky session laws Chapter 476 makes clear that references to the federal Internal Revenue Code were updated from 1985 IRC to 1989 IRC effective for tax years beginning in 1990; this is the change that eliminated the 60% exclusion (this is also consistent with All States Tax Handbook's interpretation).

- Corrected coding of Iowa alternative minimum tax. Previously, a coding error was causing the Iowa AMT not to apply 1982-1987, and that has been corrected. A variety of other details of the Iowa AMT calculation were also corrected for years 1982-present. Among other things, the itemization decision in Iowa is now deferred until all other aspects of the Iowa income tax are calculated, after a tentative value of **taxs** is computed. This allows the Iowa AMT to be appropriately factored into the decision about whether to itemize deductions on the state return. In addition code for the 1987 Iowa AMT has been corrected so that tax preference items are computed based on 1986 federal law, there is no phase-out of the exemption, and the exemption for separate filers is half of that for joint returns (see 1990 Iowa Annotated Statutes, historical notes to Section 422.5, pp. 71-72).

- Corrected computation of application of unused credits against "extra tax" for separate filing spouse in computation of **StaxAX**.

- Corrected computation of non-refundable state earned income credits in the case of married couples filing separate state returns.

- Revised code for **mintaxtype**=5 to allow state itemization choice to be independent of choice on federal return, where appropriate, and to account correctly for the fact that state income tax is not deductible from itself, where appropriate.

- Coded in "additional tax on unearned income" applying in New York 1987-1988 (see **sptx** = ueitax).

- Modified code for **mintaxtype**=1 and **mintaxtype**=2 (minimum taxes applying in NY and CA in various years) to allow for the fact that state excluded capital gains could be different than federal, and to remove state income taxes from the computation, and to allow for the fact that NY tax after credits is subtracted from tax preference items in the calculation.

- Revised code so that whenever **mintaxtype** > 0, everything is computed under both federal itemization statuses, and the federal itemization status that minimizes combined federal and state tax liability is chosen. (Previously, this was only done if **itemiz**>1 or **mintaxtype**=5, or if there was positive federal minimum tax or AMT liability). This addresses a number of states where the state AMT can vary depending on federal itemization status.

- Corrected computation of West Virginia alternative minimum tax, 1983-present. It is 25% of federal AMT less ordinary WV tax liability, not 25% of federal tentative alternative minimum tax less ordinary WV tax liability. See **mintaxtype**=10.

- Removed capital gains on charitable donations of appreciated assets from base of Minnesota alternative minimum tax 1987-1992 (Section 290.091 of the 1989 Minnesota Annotated Statutes).

- Corrected measure of income used to compute Massachusetts low-income exemptions and credits to include dividends, interest, and capital gains, all years.

- Modified SAS code for Massachusetts in all years to allow value of exemption not used to offset ordinary tax to be used against taxes on interest, dividends, and capital gains.

- Corrected value of **cgexpct** for DC 1970-1975 (it had been 100, and should have been 50).

- Overhauled the coding scheme for the income tax in Louisiana, 1975-1982. See **taxtype** = *fedtab*, and **xtaxtype** = *fedtab2*. During 1975-1979, Louisiana tax was based on tables published in the law, and during 1980-1982 the tables served as an alternative maximum tax. The calculator now uses an approximation to the published tables based on a spline regression to compute these taxes. Before, we used the ordinary tax on taxable income that was still laid out in the Louisiana code during this period, but the tables superseded the ordinary tax 1975-1979, and served as an

alternative (limit) to that ordinary tax 1980-1982. The calculator now accurately captures this.

- Changed code for **localtype**=1 to multiply local tax rate by max(0, **taxs**) instead of **taxs**.

- Corrected capital gains exclusion in North Dakota 1979-1980, changing it from 60% to 50%. ND Annotated Statutes Section 57-38-01 on definitions freezes references to the Internal Revenue Code as of a certain date, and governed the capital gains exclusion. ND session laws 1979, Chapter 602, makes clear that North Dakota did not adopt the federal change of capital gains exclusion from 50% to 60%, and ND session laws 1981 Ch. 594 Sec. 2 makes clear that the 60% exclusion begins to apply in 1981.

- Corrected a typo in the code for **sptx** = cgexmax2 which was causing the capital gains exclusion in Vermont to be too large.

\

- Corrected a problem in marginal tax rate calculations in 1981. Previously, due to a typo in the SAS code, if **oamtadj** was greater than zero in 1981, then when marginal tax rates were calculated, an increment was added to **oamtadj** regardless of whether the marginal rate on capital gains was being computed (an increment should have been added to **oamtadj** only if the marginal rate on capital gains was being computed).

REFERENCES

Note: Due to the many hundreds of state annotated statutes and session laws we collected, particular reference information for each one is not included here. This list includes only the secondary sources. A list of years for which we collected annotated statutes and/or session laws for each state is available upon request. We have retained electronically scanned PDF files of all of these laws.

Advisory Commion on Intergovernmental Relations. 1976. *Inflation and Federal and State Income Taxes*. Washington DC: U.S. Government Printing Office.

Advisory Commion on Intergovernmental Relations. 1965. *Tax Overlapping in the United States*. Washington DC: U.S. Government Printing Office.

Advisory Commion on Intergovernmental Relations. Various Years. *Significant Features of Fiscal Federalism*. (in some early years this was published under the titles *State and Local Taxes: Significant Features*; *State and Local Finances: Significant Features*; *State and Local Finances and Suggested Legislation;* or *State-Local Finances: Significant Features and Suggested Legislation*). Washington DC: U.S. Government Printing Office.

Advisory Commion on Intergovernmental Relations. Various Years. *Tax Overlapping in the United States*. Washington DC: U.S. Government Printing Office.

Baer, David. 2001. *State Taxation of Social Security and Pensions in 2000*. Washington, DC: American Association of Retired Persons Public Policy Institute.

Diamond, Walter H. and Charles F. Barrett. Various Years. *Comparative State Income Tax Guide with Forms*. Dobbs Ferry, NY: Oceana Publications, Inc.

Blakey, Roy G. and Violet Johnson. 1942. *State Income Taxes*. Chicago: Commerce Clearing House.

Blakey, Roy G. 1930. *State Income Taxation*. Minneapolis: League of Minnesota Municipalities.

Bogart, William T., and William M. Gentry. 1994. "Capital Gains Taxes and Realizations: Evidence from Interstate Comparisons." *Review of Economics and Statistics*. Vol. 77, No. 2 (May 1995), 267-282.

Commerce Clearing House. Various Years. *State Tax Handbook*. Chicago: Commerce Clearing House.

Council of State Governments. Various years. *Book of the States*. Chicago and Lexington, KY: Council of State Governments.

Diamond, Walter H. and Charles F. Barrett. 1977. *Comparative State Income Tax Guide with Forms*. Dobbs Ferry, NY: Oceana Publications.

Feenberg, Daniel Richard, and Elizabeth Coutts. 1993. *An Introduction to the TAXSIM Model*, *Journal of Policy Analysis and Management.* Vol. 12, No. 1, (Winter), pp. 189-194.

Feenberg, Daniel. 2004. *Internet TAXSIM, Version 5.1.* <http://www.nber.org/~*Taxsim*/*Taxsim*-calc5/index.html> (last accessed August 2004).

Greene, Lawrence G. 1958. *Simplex Guide to State and Federal Taxes.* New York: Oceana Publications.

H & R Block. 1971. *1971 All States Tax Guide*. Kansas City, MO: H & R Block.

H & R Block. 1972. *1972 All States Tax Guide*. Kansas City, MO: H & R Block.

Internal Revenue Service, Statistics of Income Division. Various years. *Individual Income Tax Returns*. Washington: Government Printing Office.

Internal Revenue Service, Statistics of Income Division. *Statistics of Income Bulletin* "Appendix Table A.--U.S. Individual Income Tax: Personal Exemptions and Lowest and Highest Bracket Tax Rates, and Tax Base for Regular Tax, Tax Years 1913-2003." <http://www.irs.gov/pub/irs-soi/03inta.xls>.

Internal Revenue Service. Various years. *Form 1040 and Instructions*. Washington: Government Printing Office.

Isley, Julian I. 1939. *Tax Aid: A Guide in the Preparation of Federal and State Income Taxes*. Syracuse NY: Doree Publishing Co.

Kalinka, Susan. 1990. "Federal Taxation of Community Income: A Simpler and More Equitable Approach." *Wisconsin Law Review*. (May / June): pp. 633-703.

Manison, Jno. 1946. *Community Property in Relation to Federal Income Tax*. Houston: Manison Publishing Co.

Maxwell Macmillan, Inc. Various years. *All States Tax Handbook*. Englewood Cliffs, NJ: Maxwell Macmillan.

Morrison, Vernon G. 1931. *State Income Tax Laws Applicable to Personal Incomes: A Tabular Digest.* Chicago: University of Chicago Social Science Research Committee.

National Conference of State Legislatures. 2003. *State Personal Income Taxes on Pensions and Retirement Income: Tax Year 2003*. Denver: National Conference of State Legislatures.

National Industrial Conference Board. 1930. *State Income Taxes*. New York: National Industrial Conference Board.

Pechman, Joseph A. 1987. *Federal Tax Policy.* Washington: The Brookings Institution.

Prentice Hall, Inc. 1975. *State Income Tax Forms with Official Instructions*. Englewood Cliffs, NJ: Prentice Hall.

Prentice Hall, Inc. Various years. *Tax Diary and Manual*. (also published under the title *Federal and State Tax Compendium and Diary* in some years). New York: Prentice Hall.

Prentice Hall, Inc. Various years. *All States Tax Handbook*. Englewood Cliffs, NJ: Prentice Hall.

Reich, Harry, and Sidney Sills. Various years. *The Authentic Guide to Income Tax*. New York: Authentic Publications.

Research Institute of America. Various years. *All States Tax Handbook*. Valhalla, New York: Research Institute of America.

Tax Foundation. 1962. *Retail Sales and Individual Income Taxes in State Tax Structures.* New York: Tax Foundation, Inc.

Tax Foundation. Various years. *Facts and Figures on Government Finance*. Washington, DC: Tax Foundation.

U.S. Bureau of the Census. 1922. *Digest of State Laws Relating to Taxation and Revenue*. Washington DC: Government Printing Office.

U.S. Bureau of the Census. 1932. *Digest of State Laws Relating to Taxation and Revenue*. Washington DC: Government Printing Office.

U.S. Bureau of the Census. 1940. *Digest of State Laws Relating to Net Income Taxes, 1938*. Washington DC: Government Printing Office.

Witte, John F. 1985. *The Politics and Development of the Federal Income Tax.* Madison: The University of Wisconsin Press.