



SPSD/M 

Algorithm Guide

This guide is designed primarily to provide SPSPD/M users with an understanding of the specific personal tax and cash transfer programs which are simulated, together with specific information on how each program was implemented. The guide is intended for both black box and glass box users.



Canada

Introduction

The Algorithm Guide provides SPSD/M users with a description of the specific personal tax and cash transfer programs which are simulated and the specific way in which this is done. An attempt is also made to guide and caution the user, where necessary, as to the interpretation of the results. Also included in this guide are descriptions of processing and utility algorithms which have a significant effect on the results. The guide is intended for both black box and glass box users.

The guide is organized into three main sections. After the first section (this Introduction), there is a section describing the algorithms organized into logical groupings. This is followed by an alphabetically-arranged encyclopaedic section that lists all algorithms in the SPSM.

These modules are referred to as functions. Function names are printed in lower case (e.g. `txinet`, `txcalc`). Sub-functions are defined within the function that calls them and are also shown in lower case (e.g. `uiclm`, `gissub`). Both regular and local variables are shown as usual in lowercase (immicons). These local variables may not be used for reporting purposes unless modifications are made in glass box mode.

These functions tend to have a one-to-one correspondence with actual social and tax programs. In some cases however, two functions are required for one social program (Eg. the child care expense deduction is calculated in one function and allocated to a particular family member in another), or many programs may be simulated in one function (e.g. federal and provincial family allowances are both calculated by one routine).

Subject Reference

1 Algorithm by Program

1.1 Introduction

This guide is designed primarily to provide SPSPD/M users with an understanding of the specific personal tax and cash transfer programs which are simulated, together with specific information on how each program was implemented. The guide is intended for both black-box and glass-box users.

1.2 Pre-simulation Functions

The functions in this group are executed prior to the simulation of taxes and transfers. The database is first adjusted to the users specifications, by `adj`. This adjusted database will form the basis of all base/variant combinations executed in a single program run. Parameter edit checks and the calculation of derived parameters are performed next in `mpc`. This is done based on `.apr` parameters and rules embodied in the function. Finally, calls to the tax/transfer algorithms are made for each requested base and/or variant simulation as controlled by the `drv` function.

1.2.1 Adjust Database

Three functions perform certain adjustments to the database variables prior to the execution of the tax/transfer algorithms. These adjustments can be used to increase the potential applications of the database.

<code>fmspopen</code>	Routines to read SPSPD file (<code>.spd</code>)
<code>fmxopen</code>	Routines for reading FAMEX (<code>.fxv</code>) file
<code>adj</code>	Perform SPSPD database adjustment

1.2.2 Calculate Derived Parameters

The `mpc` function calculates derived model parameters and performs edit checks on input tax/transfer algorithm parameters.

<code>mpc</code>	Calculate derived model parameters and do edits
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1.2.3 Tax/Transfer Calculator

Two functions are responsible for invoking the algorithms which calculate all taxes and transfers.

<code>call</code>	Call tax/transfer calculator
<code>drv</code>	Tax/transfer calculator

1.3 Government Cash Transfers

1.3.1 Unemployment Insurance Benefits

Unemployment Insurance benefits are calculated by a set of functions which mimic application of UI regulations to individual employment and claim histories. These functions are contained within the ui function

ui Compute UI benefits

1.3.2 Family Allowances

The famod function calculates federal Family Allowance benefits based upon the number of children in a family and their ages. The function allows for the Alberta and Quebec variations on family allowances as well as the Quebec supplementation of federal family allowances.

famod Compute family allowance

1.3.3 Federal Child Tax Benefit/Credit

This function is used to calculate either the federal Child Tax Credit program or the federal child tax benefit. Both programs are intended to provide benefits to help low and middle income families meet the costs of raising children under the age of 18.

txctc Compute child tax credit

ccept zero CCE for young kids if optimal

1.3.4 Federal Sales Tax Credits

The refundable federal Sales Tax Credit provides benefits to help low income families offset the costs of federal sales taxes. The txfstc function calculates benefits from the federal Sales Tax Credit (STC) program based upon the number and type of persons in a family and the net income of the head and spouse.

txfstc Compute federal sales tax credit

1.3.5 Elderly Programs

1.3.5.1 Old Age Security

The Old Age Security program provides taxable monthly benefits to all Canadians age 65 and over who meet the Canadian residency requirements. The SPSM calculates OAS based on the age of the individual and, for immigrants, the years since immigration. The clawback of OAS is performed in the txitax function. This program, together with the GIS program, is subsumed effective in 2001 by the senior's benefit program, implemented in SPSM by the senben algorithm.

oas Compute OAS for elderly

senben Compute Seniors Benefit for elderly

1.3.5.2 Guaranteed Income Supplement/Spouses Allowance

The Guaranteed Income Supplementation and Spouse's Allowance programs provide non-taxable monthly benefits to all Canadians age 65 and over who apply and meet the Canadian residency requirements. The program is income tested. This program, together with the OAS program, is subsumed effective in 2001 by the senior's benefit program, implemented in SPSM by the senben algorithm.

gis Compute GIS/SPA for elderly
senben Compute Seniors Benefit for elderly

1.3.5.3 Federal Seniors Benefit

The 1996 Federal Budget announced a new Seniors Benefit to replace both the Old Age Security Program and the Guaranteed Income Supplementation program. The Seniors Benefit program provides for non-taxable monthly benefits to all Canadians age 65 and over who meet the Canadian residency requirements. The program is income tested. Because of the guarantee that no persons age 60 or over at the time of the budget can opt to retain the OAS/GIS program, elements of the Federal Seniors Benefit is implemented in four SPSM functions.

senben Compute Seniors Benefit for elderly
oas Compute OAS for elderly
gis Compute GIS/SPA for elderly
ccept zero CCE for young kids if optimal

1.3.5.4 Provincial GIS Supplementation Programs

The gist function calculates benefits for seven provincial GIS supplementation programs in six provinces; Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. All modelled provincial senior's programs within SPSM are in this function.

gist Compute Provincial GIS top-ups for elderly

1.3.6 Social Assistance Benefits

This function is currently used to create a variable for social assistance by manipulating social assistance payments reported by the elderly (idisa) and GIS supplementation programs and other forms of social assistance (imigist). In addition, the splitting of Social Assistance payments between the federal and provincial governments is performed here.

samod Compute social assistance or guarantees

1.4 Federal Income and Payroll Taxes

1.4.1 Calculate Net Income

The txinet function contains several algorithms which are required to calculate net income. The

algorithms calculate the following specific tax measures.

- Employment Expense Deduction
- Other Allowable Employment Expenses
- Taxable Dividends
- Taxable Capital Gains
- Total Income
- CPP/QPP Contributions (Deduction or Tax Credit)
- UI Contributions (Deduction or Tax Credit)
- Tuition Fees (Deduction or Tax Credit)
- Calculate all deductions from total income
- Assign Taxable portion of Family Allowance to head or spouse
- Calculate Net Income

txinet Compute net income

1.4.2 Calculate Taxable Income

The process of computing taxable income is divided into two separate routines. Exemptions, deductions and tax credits which are not dependent upon information from other members of the family (e.g., the Basic Personal Exemption or Basic Personal Tax Credit) are collected together in txitax. Algorithms which require information on the age, income or deductions of a spouse or dependant are in txhstr. txitax calculates a provisional value for taxable income (imitax) which may be further adjusted by txhstr.

txitax Compute taxable income and individual credits

txhstr Compute family-related deductions or credits

1.4.3 Child Care Expense Allowance

The txcea function calculates the value of the child care expense deduction. The calculation may be optionally converted to a tax credit basis rather than a deduction.

txcea Compute child care expense allowance

1.4.4 Calculate Federal Tax

This function incorporates algorithms for the following tax measures to complete the calculation of federal taxes payable:

- Federal Dividend Tax Credit
- Basic Federal Tax (including credit transfers)
- Federal Tax Reduction (including transfer to spouse)
- Federal Surtax
- Federal Taxes Payable
- Alternate Minimum Tax
- Quebec Tax Abatement

txcalc Calculate federal income tax

1.5 Calculate Provincial Taxes

Provincial income taxes are collected by the federal government on behalf of most provinces. Quebec collects its own income tax. Algorithms for computing provincial tax range from taking a proportion of Basic Federal Tax to a parallel of the federal system in Quebec. Most provinces begin with a proportion of federal taxes but have their own systems of tax credits, surtaxes and reductions.

1.5.1 All Provinces except Quebec

txprov	Compute provincial taxes
txnfld	Compute provincial taxes for Newfoundland
txpei	Compute provincial taxes for P.E.I.
txns	Compute provincial taxes for Nova Scotia
txnb	Compute provincial taxes for New Brunswick
txont	Compute provincial taxes for Ontario
txman	Compute provincial taxes for Manitoba
txsask	Compute provincial taxes for Saskatchewan
txalta	Compute provincial taxes for Alberta
txbc	Compute provincial taxes for British Columbia

1.5.2 Quebec

txque	Compute provincial taxes for Quebec
txqinet	Compute net income (Quebec)
txqccea	Compute child care expense allowance (Quebec)
txqitax	Compute taxable income and individual credits (Quebec)
txqhstr	Compute family-related deductions or credits (Quebec)
txqcalc	Calculate income tax (Quebec)

1.6 Calculate and Assign Commodity Taxes

Sales & excise taxes are calculated by applying Input/Output based effective sales tax rates to observed family expenditures at the spending unit level of analysis in the following function..

ctmod	Compute commodity taxes for individuals and households
txhhexp	Compute and pro-rate household taxes, rent, etc.

1.7 Aggregation Routines

Two aggregation functions are used to calculate several reporting variables as aggregates of other modeled variables. The functions calculate all dollar denominated reporting variables up to the level of consummable income. In addition taxable filer status is determined.

memo1	Compute memo items for reporting
memo2	Compute consumable income, etc.

1.8 Glass Box Stub Routines

There are two empty functions in both the standard and alternate drivers (drv) that are available to allow completely new tax or benefit programs to be developed by glass box users.

dem	Compute new taxable demogrants
gai	Compute new refundable credits or guarantees

1.9 Auxiliary Functions

There are a number of auxiliary functions which are used by the functions containing the tax/transfer algorithms. These functions perform routine tasks required in simulating the tax/transfer system such as table look-ups and benefit reduction functions. The description of these functions is of use to anyone attempting to fully understand or modify the C-language source code for the tax/transfer algorithms.

classu	Compute user-defined reporting variables
isneg	Is argument negative ?
isnneg	Is argument non-negative?
isnzero	Is argument non-zero?
iszero	Is argument zero?
lkup1	Table look-up with interpolation/extrapolation
lkup2	Table look-up without interpolation
maxn	Find the maximum of two numbers

minn	Find the minimum of two numbers
nneg	Change negative numbers to zero
pmaddent	Define and add a parameter
randrnd	Randomly round a floating point number to an integer
round	Round to nearest integer
strn	Retrieve string by string number
taxbak1	One level tax-back function
taxbak2	Two level tax-back function
vardef	Define structure member as an SPSM variable

Alphabetic Reference

adj Perform SPSD database adjustment

SUMMARY

The `adj` function performs certain adjustments to the database variables prior to the execution of the tax/transfer algorithms. These adjustments can be used to increase the potential applications of the database. The function may currently be used to adjust the amount of RRSP contributions claimed. A brief description of the database adjustment in general is also included.

SPSM Implementation

The SPSD is based on surveys and administrative data collected for the 1988 calendar year. Adjustment of this data may be required for several reasons. The user may wish to use the incomes to represent the incomes in a more recent year such as 1994. As such the user would supply estimates of growth rates for income by source and expenditures from 1988 to 1994. The user may also wish to make adjustments for simulation purposes in the 1988 year. For example, known under-reporting of alcohol expenditures may be treated by scaling each household's alcohol expenses or a deduction item could be scaled down to zero to represent a restriction of a certain tax measure. Finally, the user may wish to adjust the weights of individuals and households to reflect alternate demographic assumptions.

The scaling of money items is performed in two functions inaccessible to the glass box user. Prior to the calculation of any taxes or transfers each dollar denominated database variable is multiplied by a single corresponding database adjustment parameter. There are two key exceptions to this. Employment income, comprising about 70% of total income is given more rigorous treatment due to its relative importance in the overall tax/transfer system. Employment income may be adjusted by industry specific growth rates. CPP/QPP income may be adjusted by differential rates according to age groups which allows for the phasing in of that program. Users should refer to the *Parameter Guide* in this manual for further details on specific adjustment parameters.

The `adj` function is a means for glass box users to affect the adjustment of the database in ways not currently possible. The user may add their own adjustment routines to augment or even offset current means of adjustment. For example if the user wished to grow employment income by age and sex they would set the existing employment parameter to one and enter a new algorithm in this function. One such specific database adjustment provision is currently available in black box mode and is used in the analysis of RRSP contributions.

This adjustment (which will change the value of the `idrrsp` variable) is designed to allow the user to simulate the increase in RRSP contribution limits in a rough fashion. It allows the user to increase the RRSP contributions of individuals who are near to the current

contribution limits. The facility is activated by setting the RRSPIFLAG parameter to 1. Two cases are distinguished, those who are not covered by an employer-contributed pension plan, and those who are.

If individuals had RRSP contributions but had no RPP contributions, and their RRSP contributions fell between RRSPSMIN and RRSPSMAX inclusive, their RRSP contributions will be increased by RRSPSINC.

If individuals had RPP contributions, then, for those individuals whose total pension contributions (RRSP plus RPP) fell between RRSPPEMIN and RRSPPEMAX, their RRSP contributions will be increased by RRSPEINC.

Relation to Other SPSM Routines

The `adj` function is called before `drv` and as such is only executed once for every program run. This means that database adjustments will apply to both the base and variant scenarios. The function is called after the other database adjustment routines.

CROSS REFERENCE

Function Description

INPUT PARAMETERS:

DNINCFLAG	Disable no income flag for calculation
PROVMAP	Provincial remapping [prov]
RRSPEINC	Increment to rrsp if conditions & rpp>0
RRSPPEMAX	Maximum (rpp+rrsp) for increment if rpp>0
RRSPPEMIN	Minimum (rpp+rrsp) for increment if rpp>0
RRSPIFLAG	RRSP increment activation flag
RRSPSINC	Increment to rrsp if conditions & rpp=0
RRSPSMAX	Maximum (rrsp) for increment if rpp=0
RRSPSMIN	Minimum (rrsp) for increment if rpp=0

INPUT VARIABLES:

hhnin	Number of individuals in household
idrpp	Registered pension plan contributions (207)

OUTPUT VARIABLES:

hdprov	Province
idninco	No income flag (SPSD variables)
idrrsp	RRSP calculated amount (208)

SUMMARY

Stub function for use by glass box users who wish to modify database variables either before and/or after tax/transfer calculation. This function calls the standard driver -- drv.c.

SUMMARY

The ccept function controls multiple calls to the tax transfer calculator drv

Program Description

There are three instances in which the entire calculation of the tax/transfer system for household is necessary. The ccept function controls such recalculations. Each case is discussed under separate headings below:

Pre-calculation of the child tax benefit.

The calculation of Employment Insurance depends in part upon an individual's Child Tax Benefit entitlement. However, Employment Insurance is calculated prior to the Child Tax Benefit. ccept is used to calculate a preliminary value for the child tax benefit which can then be used in the calculation of Employment Insurance. The final value for a families child tax benefit may differ from the preliminary estimate used for this calculation of Employment Insurance.

Optimization of the Child Tax Credit/Child Tax Benefit

Beginning in 1988 the rules for calculating the child tax credit/child tax benefit and the child care expense credit were altered to ensure that middle income families could not receive the full benefits from both programs. In practice this is done by reducing maximum child tax credit benefits by 25% of claimed child care expenses. The resulting situation is that below a certain income level it is advantageous not to claim any child care expenses incurred. The ccept function can locate this level and thus maximize the combined benefits from the child care expense credit and the child tax credit/child tax benefit.

Optimization of the federal Seniors Benefit

The Seniors Benefit program was proposed with the promise that no person aged 60 at the time of the release of the 1996 federal Budget would receive lower benefits under the new seniors benefit that they would be entitled to under the OAS/GIS programs. ccept determines if a senior is entitled to the OAS/GIS system of benefits and if so

SPSM Implementation

ccept performs the re-calculations and optimizations in a specific sequence. The pre-calculation of the federal Child Tax Benefit for purposes of correctly calculating Employment Insurance is performed first. Next the optimization of the child care expense deduction and the federal Child Tax Benefit is performed. Lastly, the federal Seniors Benefit is optimized. In a small number of cases where families in a given household are entitled to both the Senior's Benefit and the Child Tax Benefit, the Child Tax Benefit optimization will be 'undone' during the optimization of the Senior's benefit. This may result in a small number of spurious 'losers'. The complexity of multiple recursive calls to the tax/transfer calculator made it undesirable to try and perform an overall optimization.

The SPSM implementation of each type of optimization are described separately below:

Pre-calculation of the child tax benefit.

The first time drv is called Employment Insurance is calculated with a zero value for the federal Child Tax Benefit. This will result in no EI family supplement benefits being assigned. The first time ccept is called by drv, it first determines if a family is eligible for both EI and the Child Tax Benefit. If so, that household has its entire tax/transfer entitlements/liabilities re-calculated using the value for the federal child tax benefit calculated in the first pass.

Note that there is a circularity between the two programs in that the federal Child Tax Benefit is based, in part, on Unemployment Insurance benefits to the extent that they are included in the definition of net income which is used to clawback the child benefits.

Optimization of the Child Tax Credit/Child Tax Benefit

The default calculation first performed in txceca makes use of any child care expenses associated with the children in the family. In the ccept function cases subject to optimization are first identified as families having children aged 0-6 with associated child care expenses.

The complexities of the tax reform situation in Canada make it difficult to know how to optimize many of this type of case. Consequently, once these families have been identified, the entire tax/transfer system is recalculated, setting child care expenses for young children to zero. The value of consumable income for both runs is then compared. If the family benefits from this change, the scenario with no child care expenses is kept. Otherwise, the previous scenario is restored by again re-running the entire tax transfer system.

The algorithm is controlled by the parameter CCEZOPT, which is described in the [Parameter Guide](#).

Optimization of the federal Seniors Benefit

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the entire tax/transfer system is recalculated, setting child care expenses for young children to zero.

CROSS REFERENCE

Function Description

INPUT PARAMETERS:

CCEZOPT	CCE young kid optimization rules [1=use, 2=zero, 3=optimize]
SBOPTFLG	Optimize Seniors benefit with OAS/GIS
TARGETYEAR	Year of analysis
UIEIFSFLG	UI EI calculate family supplement flag (EI only)
UIEIOPT	UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
UITARGET	UI/EI target for the number of cases (UI and EI)

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfnkids	Number of children in census family
cfnpers	Number of persons in census family
hdageeld	Age of eldest in household
hdnkids	Number of children in household
hdprov	Province
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idcfrh	Relationship to census family head
idninco	No income flag (SPSD variables)
iduirank	Predicted ranked likelihood of getting UI
imcce	Child care expenses claimed on behalf of child
immicons	Consumable income
ucstat	Claim status flag

OUTPUT VARIABLES:

imcceni	Consumable income with CCE not zeroed
imccez	Is CCE zeroed?
imccezi	Consumable income with CCE zeroed
imfcben	Total Federal Child Benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imninc	No income flag
imsbni	Consum inc with Seniors Benefit not zeroed
imsbz	Is Seniors Benefit Zeroed?
imsbzi	Consum inc with Seniors benefit zeroed

SUMMARY

The classu function is a stub routine which allows the glass-box user to compute and assign values to new or re-defined variables. Variables first must be defined appropriately in vsdu.c and vsu.h. Since this function is normally called by both the standard and alternate model drivers, assignments made in classu will be effective in both cases.

Users should note that classu should only be used when the user is unable to create the desired classification with the User Defined Variable Facility. Please see the *User's Guide* for more information on this alternative facility.

Note that classu is called at the end of drv so that variables defined in classu are not available for use in other tax/transfer algorithms. See the *Programmer's Guide* for more information.

SUMMARY

Sales & excise taxes are calculated by applying Input/Output based effective sales tax rates to observed family expenditures at the spending unit level of analysis. The resulting federal government taxes span 48 consumer expenditure (CE) categories while provincial government taxes have both CE category and provincial dimensions. Commodity taxes are also estimated for other levels of analysis such as economic families and individuals.

Program Description

The federal government has a variety of taxes which are levied on goods used in production and for final demand consumption. Some of the major federal tax types are: custom import duties, alcohol and tobacco excise taxes and excise duties, manufacturers sales tax, gasoline excise tax, air transportation tax, and energy use taxes. The provincial governments also levy taxes but with more of an emphasis on consumer goods. Major taxes include liquor commission mark-ups, gasoline taxes, tobacco taxes, and retail sales taxes.

An important characteristic of this tax system is the cascading effect. Tax cascading occurs when a tax rate is applied to the value of a commodity inclusive of another tax type. For example, when an individual makes a long distance call a federal telecommunications tax of 10% is applied to the price of the call. Provincial governments then levy their retail sales tax rates to the value of the call inclusive of the federal tax.

SPSM Implementation

Input/Output Estimation of Tax Rates

Tax costs associated with domestic production are passed to the domestic consumers is the fundamental I/O modeling assumption. For example, alcohol producers require raw materials such as grains, water, energy source etc. If these inputs are produced themselves in other industries, then their selling price may include a manufacturer's tax component. Through Input/Output (I/O) techniques we are able to associate the implicit tax share of the production process to the correct final demand good.

The macroeconomic I/O system is used to construct effective tax rates by tax type, final demand good, and by province. This enables the calculation of the tax burden implicit in each household's reported final demand expenditures.

The federal tax rates have been grouped into six tax types: custom import duties; excise duties; manufacturer's sales tax; excise taxes; other energy taxes; and federal sales tax. The federal sales tax type that has been included for user simulations is set to zero by default. The array of provincial tax rates has also been reduced to six tax types: profits on liquor commissions; liquor gallonage tax; gasoline tax; amusement tax; tobacco tax; retail sales tax.

The above rates are defined as the ratio of a particular tax to the expenditure net of all commodity taxes for a given good in a given province. Therefore, an additional input parameter rate is applied to the FAMEX observations to net out the commodity taxes implicit in the base year.

For a more complete description of the I/O methodology, calculation procedures, tax type composition, etc. see *Commodity Tax Model User's Guide*.

Notes Regarding Expenditure Adjustments

Prior to the execution of the ctmof function, two modifications of the FAMEX data have been performed by the SPSM.

The first is made necessary because of the way SNA and FAMEX treat the expenditures on motor vehicles as net expenditures. If the trade-in exceeds the value of the purchase, or a household sells a vehicle outright, then the expenditure category will contain a negative value. In this case the SPSM treats the net expenditure as an income item (net sale of durables) and it is incorporated into the income calculation. The expenditure category is then set to zero. This procedure is conducted in the two consumer expenditure categories where net sales can occur: New & used automobiles; Recreation, sporting goods, and camping equipment. This modification is not accessible to the user.

The second data modification involves correcting for under-coverage of some FAMEX expenditure components. For example, sales of alcohol and tobacco are monitored very carefully by government agencies and their data indicate roughly twice as much consumption of these two goods as reported on the FAMEX. Two other FAMEX categories report substantially lower consumption than other information sources would indicate. They are semi-durables and expenditures for restaurants & hotels. The GFFMX parameter in the .APR file enables the adjustment of raw FAMEX values to the levels of other sources. We provide users with factors to inflate expenditures to known 1984 levels.

Estimation of commodity taxes

The ctmod function initially calls the ctfx sub-function to calculate the taxes based on the expenditure patterns of FAMEX spending units. The ctmod function then computes the taxes for other levels of analysis such as individuals or economic families.

The FAMEX expenditure categories must be stripped of their original tax component before the commodity tax calculation can be performed. This is accomplished in the ctfx sub-function by applying the I/O computed CTTXRM parameter (database adjustment parameter) to the expenditure observations.

The effective commodity tax rates are then multiplied by the net expenditures to produce commodity tax levels for each spending unit. If the CTDFLAG is set to 0 then total federal level taxes by commodity and provincial level taxes by commodity and province are calculated. If CTDFLAG is set to 1 then the six detailed federal taxes and seven provincial taxes are generated. Provincial taxes applied are defined in the following input parameters:

- CTPAMU Provincial amusement tax
- CTPGAS Provincial gasoline tax
- CTPICT Provincial commodity taxes on industry
- CTPLGL Provincial liquor gallonage tax
- CTPPLQ Provincial profits on liquor commissions
- CTPRST Provincial retail sales tax
- CTPTOB Provincial tobacco tax

The model ensures that both options will produce identical results in the aggregate.

Commodity taxes are then allocated to individuals in the FAMEX spending unit via personal income shares in the ctmod function. The income of the household's head is derived by adding three variables from the FAMEX income concept not surveyed elsewhere to his/her SPSD income concept variables. These variables are: savings; other money receipts; and net sales of durables. The shares reflect the income distribution after this modification.

The CTOPT parameter controls which income concept is used in the simulation. If the parameter is set to 1 then the FAMEX income concept is used. This measure of income is not linked to other SPSD variables in any way. Therefore, if the user wishes to examine the implications to commodity tax outflows based upon changes in SPSD income variables (i.e. OAS, GIS, income tax changes) then this option should never be specified. Its use should be restricted to pure FAMEX analyses.

If CTOPT is set to 2 then the SPSD income concept is used. This income measure has been corrected for an income bias inherent in Survey of Consumer Finance (SCF) data using Department of Revenue Green Book tax data. This income adjustment is described in detail in the *Database Creation Guide*. The result is a substantial increase in household income for observations in the extreme upper tail.

The FAMEX data suffers from the same under-coverage as the SCF so the reported spending unit expenditure can be out of synch with the Green Book adjusted income. For example, the

largest total expenditure observation is around \$150,000 while a large tax adjusted household income exceeds \$5,000,000.

Setting the CTOPT parameter to 2 scales the commodity tax calculated conditioned on FAMEX spending unit income by the ratio of the SPSD "shared" income concept to an equivalent FAMEX "shared" income concept. In this way tax outlays bear closer relation to the SPSD income levels. However, this leads to some outlay distortions for the extremely wealthy which are described in the Interpretation Section.

Interpretation

There are some other discrepancies between the system of national accounts (SNA) definition of consumer expenditure and that of FAMEX. Generally, SNA includes the entire personal sector whose components are households, self-employed professionals, and universities. FAMEX tracks only households and, therefore, tax levels by commodity are generally lower. For a detailed description of these differences see the [Commodity Tax Model User's Guide](#)

In the aggregate, differences between income SPSM income concept (CTOPT=2) and the FAMEX income concept (CTOPT=1) are almost negligible. Using 1984 base case parameters the FAMEX option produced a \$20.997 billion tax burden on Canadian families while the scaled option generated \$21.048 billion. These compare favorably with the SNA estimate of \$22.5 billion. However, the differences for the highest income households in great. The top three households show differences of over \$200,000. This implies some caution when interpreting commodity tax values for high income observations.

Relation to Other SPSM Routines

The ctmod function calls the ctfx sub-function in order to calculate spending unit commodity taxes. The ctmod function itself is called by the drv function. The ctmod function makes use of parameters derived in the mpc function. The mpc function also ensures that the ctmod function is not executed if the FAMEX data vector is not being read (i.e. if FXVFLAG=0). The calculation of commodity taxes is highly dependent on the parameters applied to the database expenditure items during the database adjustment phase of the simulator.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTFAMSNA	FAMEX->SNA conceptual conversion factor [com]
CTDFLAG	Commodity tax detailed calculation flag
CTFCID	Federal custom import duties [com]
CTFEXD	Federal excise duties [com]
CTFEXT	Federal excise taxes [com]
CTFGST	Federal GST [com]

CTFLAG	Commodity tax activation flag
CTFMFG	Federal manufacturer's sales [com]
CTFOEN	Federal other energy taxes [com]
CTFTOT	Federal total retail tax equivalent
CTLPROP	Local property taxes
CTNES	Expenditures NES
CTOPT	Commodity tax calculation method [1=FAMEX,2=SPSM]
CTPAMU	Provincial amusement tax [prov]
CTPGAS	Provincial gasoline tax [prov]
CTPLGL	Provincial liquor gallonage tax [prov]
CTPPLQ	Provincial profits on liquor commissions [prov]
CTPRST	Provincial retail sales tax [com x prov]
CTPTOB	Provincial tobacco tax [prov]
CTPTOT	Provincial total retail tax equivalent
CTSAVE	All positive savings

INPUT VARIABLES:

ctnexp	Household expenditure net of taxes
ctothmon	Household money from other sources
cttxfc	Federal commodity taxes (total)
cttxpc	Provincial commodity taxes (total)
fxfomr	Other money receipts
fxgvpen	Gvt pension plan contributions
fxintpl	Interest on personal loans
fxio	I/O expenditure categories [array]
fxipac	Life ins prems and annuity contributions
fxnes	Not elsewhere stated
fxnsave	Negative savings
fxprtax	Property tax
fxpsave	Positive savings
fxpvpen	Private pension plan contributions
fxrecom	Real estate commissions
fxrfees	Registration and license fees
fxsaldur	Sale of durables
fxseqhv	FAMEX record sequence number
fxtptax	Transfer of Property taxes
hdprov	Province
hhnin	Number of individuals in household
idhhrh	Relationship to head of household
immdisp	Disposable income

OUTPUT VARIABLES:

ctfcid	Federal custom import duties
ctfexd	Federal excise duties
ctfext	Federal excise taxes
ctfgst	Federal GST
ctfmfg	Federal manufacturer's sales tax
ctfoen	Federal other energy taxes
ctishrh	Shared income concept (FAMEX)
ctlprop	Local property taxes on owned dwellings
ctnes	Household expenditure not elsewhere specified
ctnexp	Household expenditure net of taxes
ctnexp_	Household expenditure net of taxes [array]
ctothmon	Household money from other sources
ctpamu	Provincial amusement tax
ctpgas	Provincial gasoline tax
ctplgl	Provincial liquor gallonage taxes

ctpplq	Provincial profits on liquor commissions
ctprov	Province for COMTAX calculations
ctprst	Provincial retail sales tax
ctptob	Provincial tobacco tax
ctsave	Household savings
ctseqhv	FAMEX record sequence number
cttxfc	Federal commodity taxes (total)
cttxfc_	Federal commodity taxes [array]
cttxpc	Provincial commodity taxes (total)
cttxpc_	Provincial commodity taxes [array]
imishri	Shared income concept (FAMEX & SPSD)
imninc	No income flag
imtxfc	Federal commodity taxes
imtxpc	Provincial commodity taxes

dem Compute new taxable demogrants

SUMMARY

This is a stub function for use by glass box users who wish to incorporate a new program which interacts with the tax system (i.e. taxable benefits).

CROSS REFERENCE

Function	Description
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INPUT VARIABLES:

hhnin	Number of individuals in household
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OUTPUT VARIABLES:

imiotg	Other taxable demogrants
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drv Tax/transfer calculator

SUMMARY

The calculation of taxes and cash transfers for any base or variant run is controlled by a function whose only task is to call all other individual tax/transfer algorithm functions. The sequence of calls is critical to the simulation due to the informational requirements of the

tax/transfer functions. For example net income must be known before gis can be calculated. The following list gives the functions called by drv in the order in which they are called.

Function	Description
ui	Compute UI benefits
famod	Compute family allowance
oas	Compute OAS for elderly
dem	Stub routine for new pre-tax system programs
txinet	Compute net income (including payroll taxes)
gis	Compute GIS/SPA for elderly
senben	Compute senior benefit
gist	Compute Provincial GIS top-ups for elderly(GAINS-A, SIP, etc)
samod	Compute social assistance or guarantees
txitax	Compute taxable income
txhstr	Apply tax transfers between head and spouse
txcalc	Calculate federal income tax
txctc	Compute child tax credit
txprov	Compute provincial taxes and credits
txfstc	Compute federal sales tax credit
gai	Stub routine for new post-tax system programs
memo1	Compute memo items for reporting
ctmod	Compute commodity taxes
memo2	Compute consumable income, etc.
cceopt	Zero CCE for young children if optimal
Classu	Stub routine to compute user defined reporting variables

The calling order of the component functions of drv reflects the logical precedence between them.

- The first functions, ui, famod and oas, simulate programs whose benefits are determined by factors other than income and as such are called first.
- dem is a stub routine for glass box applications that require calculations to occur before entering the tax system routines.
- txinet calculates net income prior to certain transfers.
- gis calculates transfers to the elderly.
- senben calculates senior benefits.
- gist, txctc, and txfstc calculate income tested transfer programs.
- samod calculates social assistance or guaranteed income transfers.
- Federal and provincial taxes are calculated next in the next six functions with the tx prefix (txitax, txhstr, txcalc, txprov, txctc, and txfstc).
- gai is another stub routine that is intended for use by glass box users who wish to simulate options requiring information on all personal income taxes and cash transfers. For example users may use this function to simulate an income supplementation program.
- The memo1 and memo2 functions create aggregate variables for reporting.
- In the ctmod function, sales & excise taxes are calculated by applying Input/Output based effective sales tax rates to observed family expenditures.
- ccept optimizes income by maximizing the child care expense credit and the child tax credit.
- classu is a stub routine which allows the glass box user to compute and assign values to new or re-defined variables.

The functions called by drv call other functions and sub-functions in order to complete their calculations. The following page contains a complete list of the names of functions and sub-functions along with a short description in the order in which they are called by drv. Please refer to the specific function in this guide for a more detailed description. Sub-functions (in italic) can be found listed under the function which calls them. Thus for a complete understanding of the calculation of net income one would have to consult both the txinet and txceca functions.

As mentioned earlier, function names are printed in lower case, bold, courier font (E.g. txinet, txcalc) and correspond to a single C language source code file (E.g. txinet.c, txcalc.c). Sub-functions are defined within the function (file) that calls them and are shown in lower case, courier font, italic (e.g. uisqz, gissub). All multiple calls to the same sub-function have been shown here. All functions directly called by drv begin in the first column below, other function calls are indented.

In ccept all the functions are called a second time by drv to find if a family benefit of setting CCE to zero, if it is the case the result is kept, otherwise drv call again all the functions to reset the original values.

ui		Compute UI benefits
	<i>uicl</i> m	Simulate a UI claim

	<i>uielent</i>	Test UI eligibility: entrance requirements
	<i>uielrge</i>	Test UI eligibility: regional rules
	<i>uielrep</i>	Test UI eligibility: repeater rules
	<i>uiwkbas</i>	UI weeks of benefits: basic entitlement
	<i>uiwklfe</i>	UI weeks of benefits: labour force extended phase
	<i>uiwkrge</i>	UI weeks of benefits: regional extended benefits
	<i>uisqz</i>	Squeeze UI phases into time window
	<i>uitrnclm</i>	tack on a training claim for those eligible
	<i>uiclm</i>	Simulate a UI claim
	<i>uielent</i>	Test UI eligibility: entrance requirements
	<i>uielrge</i>	Test UI eligibility: regional rules
	<i>uielrep</i>	Test UI eligibility: repeater rules
	<i>uiwkbas</i>	UI weeks of benefits: basic entitlement
	<i>uiwklfe</i>	UI weeks of benefits: labour force extended phase
	<i>uiwkrge</i>	UI weeks of benefits: regional extended benefits
	<i>uisqz</i>	Squeeze UI phases into time window
	<i>uitrnclm</i>	tack on a training claim for those eligible
famod		Compute family allowance
oas		Compute OAS for elderly
dem		Stub routine for new pre-tax system programs
txinet		Compute net income
	<i>txccea</i>	Compute child care expense allowance
gis		Compute GIS/SPA for elderly
	<i>gissub</i>	Compute income used to tax back GIS/SPA
senben		Compute senior benefit
	<i>sbsub</i>	Compute income used to tax back Seniors Benefit
gist		Compute Provincial GIS top-ups for elderly
	<i>txhhexp</i>	Compute and pro-rate household taxes, rent, etc.
samod		Compute social assistance or guarantees
txitax		Compute taxable income
txhstr		Apply tax transfers between head and spouse
txcalc		Calculate federal income tax
txprov		Compute provincial taxes
	<i>txnfld</i>	Compute Newfoundland provincial taxes
	<i>txpei</i>	Compute PEI provincial taxes
	<i>txns</i>	Compute Nova Scotia provincial taxes
	<i>txnb</i>	Compute New Brunswick provincial taxes
	<i>txque</i>	Compute Quebec provincial taxes

		txqinet	Compute net income (Quebec)
		txqccea	Compute child care expense allowance (Quebec)
		txqitax	Compute taxable income (Quebec)
		txqhstr	Apply tax transfers between head and spouse (Quebec)
		txqcalc	Calculate Income Tax (Quebec)
		txhhexp	Compute and pro-rate household taxes, rent, etc.
	txont		Compute Ontario provincial taxes
		txhhexp	Compute and pro-rate household taxes, rent, etc.
	txman		Compute Manitoba provincial taxes
		txhhexp	Compute and pro-rate household taxes, rent, etc.
	txsask		Compute Saskatchewan provincial taxes
	txalta		Compute Alberta provincial taxes
	txbc		Compute BC provincial taxes
		txhhexp	Compute and pro-rate household taxes, rent, etc.
txctc			Compute child tax credit
txfstc			Compute federal sales tax credit
gai			Stub routine for new post-tax system programs
memo1			Compute memo items for reporting
ctmod			Compute commodity taxes
	<i>ctfx</i>		Compute commodity taxes for FAMEX spending unit
		<i>ctfxd</i>	Compute commodity taxes for FAMEX spending unit (detailed)
		<i>ctfxs</i>	Compute commodity taxes for FAMEX spending unit (simple)
memo2			Compute consumable income, etc.
cceopt			Zero CCE for young kids if optimal
	<i>pass2</i>		recalculate UI with child benefits in place
		drv	Conditional execution of the Tax/Transfer Calculator
		drv	Conditional execution of the Tax/Transfer Calculator
classu			Compute User Defined Reporting Variables

SUMMARY

The famod function calculates federal Family Allowance benefits based upon the number of children in a family and their ages. The function allows for the Alberta and Quebec variations on family allowances as well as the Quebec supplementation of federal family allowances.

Following 1997 reform, starting in 1998 in the model, the Quebec family allowance, the Quebec new born allocation and the Quebec availability allowance are now calculated only if QFATCOPT is set to 1, otherwise the Quebec Family Allowance Tax Credit is calculated in txqcalc.

Program Description

The federal Family Allowances program was designed to provide taxable benefits to help meet the costs of raising children under the age of 18 who are resident in Canada and are maintained by their parent(s) or guardian. At least one parent or guardian must be either a Canadian citizen or a permanent resident, visitor or holder of a Minister's Permit under the Immigration Act and have been legally admitted into Canada. The parent(s) or guardian must make application for benefits and their income must be subject to Canadian income tax. Benefits cease to be payable with regard to self-supporting children (i.e. children who begin to earn a taxable income).

Family allowance benefits are generally paid at a uniform rate across Canada. However, provinces may, within certain limits, vary the amount of Family Allowances that the federal government pays to their residents according to the age and/or number of children in a family. Alberta and Quebec are the only provinces that vary the rate. Alberta varies payment based on the age of the child while Quebec varies payment based on the number of children in the family and then adds a supplement based on the age of the child.

The province of Quebec maintains a separate but linked program under the Quebec Family Allowances Act which provides for benefits to the parent or guardian of an unmarried child under the age of 18 who is not a ward of the province. The applicant must have resided in Quebec for at least one month or be paying Quebec income tax. In 1984 benefits payable were not subject to Quebec income tax, however benefits paid with respect to children aged 16 and 17 were subject to federal tax. Persons in receipt of federal family allowances automatically receive the provincial benefits without application. This program also has a supplement for handicapped children; however, this is not modeled in the SPSM.

The Quebec family allowances are "integrated" with other parts of the Quebec income tax system (Eg. availability allowances). The Quebec availability allowance is calculated as a tax credit and is modelled in function txqcalc for the years 1984-1987. The Quebec Newborn Allowance was implemented in 1988 and is modeled in famod from that year. Benefits are

paid per child and rise from \$500.00 for each of the first two children to \$3000.00 for each subsequent child.

An option permit the user to randomly increase the rank of first and second child in order to reflect the rank distribution of child observed by the RRQ. The program end in October 1997 and is replaced by a Child tax allocation not modeled yet.

SPSM Implementation

The famod function calculates federal and provincial family allowances based on the age of children and number of children in a family. Residency requirements are deemed to have been met in all cases as is the requirement of non self-sufficiency. The function always allocates family allowances as income of the mother unless one is not present in the nuclear family. This temporary allocation is subsequently assigned to the spouse having the higher net income in txinet and txqinet. The function outputs values for federal(imffa) and provincial(impfa) family allowances as well as the value of taxable family allowances(imtfa) for use in other functions. The function loops through each nuclear family in a household.

The function first calculates federal and provincial family allowances for residents of Quebec. Counts of numbers of children by age group are calculated and used to index into two look-up tables for federal and provincial programs as well as to scale the federal age supplement. The values are then aggregated into two local variables, taxable family allowances and federal family allowances. Taxable family allowances are equal to the sum of federal benefits for each child (as determined by that child's rank in the family) plus the federal supplement for each child aged 12-17 plus the portion of Quebec family allowances paid with respect to children aged 16 and 17.

The calculation of Quebec allowances in famod includes the Quebec availability allowance from 1988 forward. It is paid as a supplement to the Quebec family allowances and is represented by the variable imqaafa. Quebec allowances also include the calculation of the Quebec Newborn Allowance, represented by the variable imqnbfa. This benefit is calculated on the following schedule for 1988:

Child Number	Birth	Age 1	Age 2	Total
1	500	0		500
2	500	0		500
3+	375/Quarter	375/Quarter		3,000

Interpretation

Results obtained from the SPSM with respect to family allowance benefits differ from Health and Welfare Canada administrative data. Overall the SPSM reports 96.7% of the 1984 calendar year average health and welfare total dollars and 97.3% of children for whom benefits are received.

The SPSM has few children in part due to the non-coverage of Yukon, N.W.T., and native reservations, all of which have younger than average populations and larger than average family sizes (approximately 1.5% of children). A second source of underestimation is the special allowances for foster children and children in welfare agencies. The SPSD does not

include these children or their benefits which account for .7% of total family allowances. Further, the SPSM does not take into account payments made outside Canada, although the effect of these on the total is insignificant (less than .1%).

The family allowance program requires parents of 'self-supporting' children to notify Health and Welfare Canada and have the benefits with respect to these children suspended. There are about 52,000 of such children aged 16 and 17 on the SPSD with respect to whom benefits are allocated. It is unknown how many of the parents of these children actually report their situation to Health and Welfare Canada. Lastly, no residency check is imposed on the parents and this will have an insignificant effect. It is assumed that the number of children turning age 18 during the calendar year is balanced by the number of new births. That is, full year family allowance benefits paid with respect to children born during 1984 will be overestimates to the same degree that an underestimate arises for benefits not given to 18 year olds who were 17 during calendar 1984.

Relation to Other SPSM Routines

The famod function is called by drv. The function outputs two variables that are used in txinet for deciding which parent will claim the family allowances for tax purposes: taxable family allowances(nftfa) and number of family allowance children(nfnfach).

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
AFAC1	Alberta FA benefit per child aged 0 - 6
AFAC2	Alberta FA benefit per child aged 7 - 11
AFAC3	Alberta FA benefit per child aged 12- 15
AFAC4	Alberta FA benefit per child aged 16- 17
FAFLAG	Family allowance flag
PFACFLAG	Use provincial configuration flag
QAAFA	Quebec availability allowance (supplement) [parity,\$]
QAAFAFLAG	Availability Allowance: Supplement to Quebec FA
QFAIFLAG	Quebec inclusion of federal family allowance in income flag
QFATCOPT	Quebec Family Allowance Tax Credit Option tranfer=1, tax credit=2
QFATFLAG	Make Provincial FA to 16 & 17 year olds taxable
QFFSL	Federal family allowance: Quebec Configuration[parity,\$]
QFPSL	Quebec provincial family allowance [parity,\$]
QFS	Federal supplement per child 12-17 in Quebec configuration
QNBFA	Quebec newborn family allowance [parity,age]
QNBFAFLAG	Quebec newborn family allowance flag
QNBPOFLAG	Quebec newborn family allowance phase out flag
QNBPOPYR	Quebec newborn family allowance phase-out year proportion
QNBPOYR	Quebec newborn family allowance phase out year
QNRFLAG	Quebec newborn family random increase of child rank
STDFFA	Standard federal family allowance per child

TARGETYEAR Year of analysis

INPUT VARIABLES:

hdprov Province
hhnnf Number of nuclear families in household
idage Age
idrand Random numbers [array]
idsex Sex
nfinch First child in nuclear family [pointer]
nfinspo Spouse of eldest [pointer]
nfnkids Number of children in nuclear family
nfspoflg Nuclear family contains married couple

OUTPUT VARIABLES:

imffa Federal portion of family allowances
imnfach Number of family allowance children claimed
imninc No income flag
impfa Provincial family allowance
imqaafa Quebec Availability Allowance FA Supplement
imqnbfa Quebec newborn Allowance
imqtfa Quebec taxable family allowances
imtfa Taxable family allowances
nfineld Eldest person in nuclear family [pointer]

fmxopen Routines for reading FAMEX (.fxv) file

SUMMARY

The purpose of this maintenance function is to load the FAMEX variables and to grow them by the corresponding database adjustment parameter.

CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

CTCFALC	FAMEX reporting error adjustment: Alcohol [prov]
CTCFGAS	FAMEX reporting error adjustment: Gasoline [prov]
CTCFTOB	FAMEX reporting error adjustment: Tobacco [prov]
CTTXRM	Base year commodity tax removal factor [com x prov]
GFCQP	Adjustment Factor: CPP/QPP contributions
GFFABD	Adjustment Factor: Account balancing difference
GFFMX	Adjustment Factor: consumer expenditure categories
[commodity]	
GFFOMR	Adjustment Factor: Other money receipts
GFGVPEN	Adjustment Factor: Government pension plan contributions

GFHMKT	Adjustment Factor: Market value of home
GFHMORT	Adjustment Factor: Mortgage value outstanding
GFINTAX	Adjustment Factor: Income taxes
GFINTPL	Adjustment Factor: Interest on personal loans
GFIPAC	Adjustment Factor: Life insurance premiums and annuity contributions
GFMORTI	Adjustment Factor: Mortgage interest paid
GFNCAL	Adjustment Factor: Net change in assets and liabilities
GFNES	Adjustment Factor: Not elsewhere stated
GFPR TAX	Adjustment Factor: Property tax
GFVPEN	Adjustment Factor: Private pension plan contributions
GFRECOM	Adjustment Factor: Real estate commissions
GFRFEE S	Adjustment Factor: Registration and license fees
GFRRSPT	Adjustment Factor: Total RRSP contributions (FAMEX)
GFPTAX	Adjustment Factor: Transfer of property taxes
GFUIC	Adjustment Factor: UI contributions
KEEPNEGEXP	Retain negative expenditures in FAMEX
DBVERSION	Version of the database (x100)
INPF XV	Name of FAMEX vector file (in) [string]
INPSD	Name of SPSD file (in) [string]

INPUT VARIABLES:

fhbfver	SPSD/M binary format version (x100)
fhdbver	SPSD/M database/year version (x100)
fhfiltyp	File type (extension) [string]
fhnum	Number of numbers in the file
frcl ohv	Cloning factor for FAMEX exp. vector
fr cqp	Cpp - qpp contributions
frfabd	Account balancing difference
frfomr	Other money receipts
frgvpen	Gvt pension plan contributions
frhmkt	Market value of home
frhmort	Mortgage value outstanding
frintax	Income taxes
frintpl	Interest on personal loans
fr io	Expenditure on the 40 I/O categories [array]
fr ipac	Life ins prems and annuity contributions
frmorti	Mortgage interest paid
frncal	Net change in assets and liabilities
frnes	Not elsewhere stated
frprtax	Property tax
frpvpen	Private pension plan contributions
frrecom	Real estate commissions
fr rfees	Registration and license fees
frrgvlot	Ratio of spending on government lotteries
fr rrspt	Total RRSP contributions (FAMEX)
frtptax	Transfer of Property taxes
fr uic	UI contributions
hdprov	Province

OUTPUT VARIABLES:

fhhash	Hashed code of header information
fxcl ohv	FAMEX cloning factor
fx cqp	Cpp - qpp contributions
fxfabd	Account balancing difference
fxfomr	Other money receipts
fxgvpen	Gvt pension plan contributions

fxhmkt	Market value of home
fxhmort	Mortgage value outstanding
fxintax	Income taxes
fxintpl	Interest on personal loans
fxio	I/O expenditure categories [array]
fxipac	Life ins prems and annuity contributions
fxmorti	Mortgage interest paid
fxncal	Net change in assets and liabilities
fxnes	Not elsewhere stated
fxnsave	Negative savings
fxprtax	Property tax
fxpsave	Positive savings
fxpvpen	Private pension plan contributions
fxrecom	Real estate commissions
fxrfees	Registration and license fees
fxrgvlot	Ratio of spending on government lotteries
fxrrspt	Total RRSP contributions (FAMEX)
fxsaldur	Sale of durables
fxseqhv	FAMEX record sequence number
fxtptax	Transfer of Property taxes
fxuic	UI contributions
hdfrstfx	First household in FAMEX group flag
hdlastfx	Last household in FAMEX group flag
hdwgtfx	Sum of household weight for FAMEX group

fmspopen Routines to read SPSD file (.spd)

SUMMARY

The purpose of this maintenance function is to load the SPSD variables and to grow them by the corresponding database adjustment parameter. In addition the method of conversion for converted variables is applied. The logic for differential growth of CPP is also applied in this function. The actual code in this function is proprietary and is not released with the SPSD/M product.

CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

GFADDED	Growth Factor: Additional deductions from net income (256)
GFALEXP	Growth Factor: Other allowable employment expenses (229)
GFCAPGEX	Growth Factor: Capital gains exemptions (254)
GFCARRY	Growth Factor: Carrying charges (221)
GFC CET	Growth Factor: Child care expenses associated with child

GFCETT	Growth Factor: Child care expenses (Limit A, Form T778)
GFCHARIT	Growth Factor: Charitable donations (340)
GFCLOSS	Growth Factor: Allowable other years capital loss (253)
GFCPP65	Growth Factor: CPP for age 65
GFCPP66	Growth Factor: CPP for age 66
GFCPP67	Growth Factor: CPP for age 67
GFCPP68	Growth Factor: CPP for age 68
GFCPP69	Growth Factor: CPP for age 69
GFCPP70	Growth Factor: CPP for age 70
GFCPP71	Growth Factor: CPP for age 71
GFCPP72	Growth Factor: CPP for age 72
GFCPP73	Growth Factor: CPP for age 73
GFCPP74	Growth Factor: CPP for age 74
GFCPP75	Growth Factor: CPP for age 75
GFCPPG75	Growth Factor: CPP for age > 75
GFPP65	Growth Factor: CPP for age < 65
GFDALIMO	Growth Factor: Alimony paid (220)
GFDISOTH	Growth Factor: Disability amount for dependants (318)
GFDISSLF	Growth Factor: Disability amount for self (316)
GFDUES	Growth Factor: Union and professional dues (212)
GFEMPLO	Growth Factor: Employee home relocation loan dedn (248)
GFEXPLOR	Growth Factor: Exploration and development expenses (224)
GFFDSFT	Growth Factor: Foreign tax credit applied to surtax (511)
GFFORAVG	Growth Factor: Forward averaging amount withdrawal (237)
GFFORINC	Growth Factor: Net foreign income (508)
GFFORTX	Growth Factor: Foreign tax paid (507)
GFGIFTS	Growth Factor: Gifts to Canada/provinces/culture (342)
GFGSTREB	Growth Factor: GST rebate (457)
GFHOMSTU	Growth Factor: College residence/resident homeowner
assistance (558)	
GFHOSSLF	Growth Factor: Ontario HOSP contributions - self (598)
GFHOSSPO	Growth Factor: Ontario HOSP contributions - spouse (599)
GFIALIMO	Growth Factor: Alimony Income
GFICAPG	Growth Factor: Capital gains (actual) (127 * 1.5)
GFIDIV	Growth Factor: Dividend income (actual) (120 / 1.5)
GFIEMP	Growth Factor: Employment income [province,sex]
GFIIINT	Growth Factor: Interest income (121)
GFIILOSS	Growth Factor: Business investment losses (217)
GFINOGRV	Growth Factor: Other government income (non-taxable)
GFINOTH	Growth Factor: Other money income (non-taxable)
GFIOINV	Growth Factor: Other investment income with net rental
GFIPENS	Growth Factor: Pension income (115)
GFISA	Growth Factor: Social assistance income
GFISEFM	Growth Factor: Self-employed income - farming
GFISENF	Growth Factor: Self-employed income - non-farming
GFITC	Growth Factor: Federal investment tax credits (412)
GFITOGV	Growth Factor: Other government income (taxable)
GFITOTH	Growth Factor: Other non-government income (taxable)
GFITRRSP	Growth Factor: Taxable RRSP withdrawals
GFIVETP	Growth Factor: Veterans Pensions
GFIIWORKC	Growth Factor: Worker's compensation
GFLABTXG	Growth Factor: Labour funds tax credit (414)
GFMEDGRO	Growth Factor: Medical expenses, gross (330)
GFMINCAR	Growth Factor: Minimum tax carryover (504)
GFMOVEXP	Growth Factor: Imputed moving expenses (219)
GFMSCHPD	Growth Factor: Manitoba school taxes paid
GFNCLOS	Growth Factor: Allowable other years non-capital loss (252)

GFNORTH	Growth Factor: Northern deductions (255)
GFOTHDED	Growth Factor: Other deductions from total income (232)
GFOTHPE	Growth Factor: Other dependant exemptions (305)
GFPARTLO	Growth Factor: Limited partnership losses (251)
GFPOLCON	Growth Factor: Federal political contributions (409)
GFPROPTX	Growth Factor: Net property taxes paid (556)
GFPRVFTC	Growth Factor: Provincial foreign tax credit (Form T2036)
GFPRVPOL	Growth Factor: Provincial political contributions (565)
GFRENTPD	Growth Factor: Total rental payments (555)
GFRPP	Growth Factor: Registered pension plan contributions (207)
GFRRSP	Growth Factor: RRSP contributions (208)
GFSAPEAD	Growth Factor: Predicted benefits from Social Assistance
GFSCFCQP	Growth Factor: SCF CPP
GFSCFCTC	Growth Factor: Child tax credit
GFSCFFTC	Growth Factor: Federal tax credit
GFSCFINT	Growth Factor: SCF interest income
GFSCFOAS	Growth Factor: Old age security
GFSCFPTC	Growth Factor: SCF provincial tax credits
GFSCFSA	Growth Factor: SCF social assistance
GFSCFUIB	Growth Factor: Unemployment insurance benefits
GFSTKDED	Growth Factor: Stock option deduction (249)
GFTUITN	Growth Factor: Tuition fees (320)
GFUIIPRED	Growth Factor: Predicted benefits from UI
GFVENCAP	Growth Factor: Venture capital tax credit (564)
IEMPADJ	Adjustment Factor: Employment income [employment income breaks, province]
IEMPBRK	Adjustment Factor: Income breaks for income adjustment [employment income breaks]
IMPCQPOPT	Imputation method, CQP [1=none 2=rank]
IMPINTOPT	Imputation method, Interest [1=none 2=imputed]
IMPSAOPT	Imputation method, SA [1=none 2=rank]
IMPUIBOPT	Imputation method, UI [1=none 2=rank]
PURR	Ratio current:base unemployment rate [prov]
UIBASEYRMAX	Maximum insurable earnings for base year
UITARGYRMAX	Maximum insurable earnings for target year
FXVFLAG	Read FAMEX expenditure vector file
INSPSD	Name of SPSD file (in) [string]
WGTFFLAG	Read weight file

INPUT VARIABLES:

fhbfver	SPSD/M binary format version (x100)
fhdbver	SPSD/M database/year version (x100)
fhfiltyp	File type (extension) [string]
fhnhh	Number of households in the file
hrbdrms	Number of bedrooms
hrclohh	Number of SCF clones
hrprov	Province
hrroom	Number of rooms
hrtedur	Tenure
hrurb	Size of urban area
idage	Age
idccqp	Converted CPP/CQP benefit
idcintim	Converted interest income (imputed)
idcsa	Converted social assistance
idsex	Sex
irage	Age
irccqp	Converted CPP/CQP

ircfpub	SCF CF publication flag
ircfrh	Relation to census family head
ircfseq	Census family sub-sequence number
ircintim	Converted interest income (imputed)
irclufg	Common law union flag
ircsa	Converted social assistance
ircuib	Converted UI benefit
iredlev	Educational level
irefpub	SCF EF publication flag
irefrh	Relation to economic family head
irefseq	Economic family sub-sequence number
irestat	Educational status
irhhrh	Relation to household head
iriefg	Institutionalized elderly flag
irimmi	Years since immigrant arrival
irind	Industry
irinseq	Individual sub-sequence number
irlfst	Labour force status
irlyfp	Full or part-time last year
irlystr	Stretches of unemployment last year
irlyun	Weeks unemployed last year
irlyww	Weeks worked last year
irmarst	Marital status
irnonlf	Main activity for non-lf persons
irocc	Occupation
irrklyun	Raking foundation: weeks worked
irrklyww	Raking foundation: weeks unemployed
irscfflg	SCF high-income preservation flag
irschtp	School type
irsex	Sex
irsynthi	Synthetic high income person
m0val	Money item value
m1val	Money item value
m2val	Money item value
m3val	Money item value
urbtyp	Claim type
ureff	Base year effective weekly benefit
urern	Base year insurable weekly earnings
urexhas	Exhaustee flag
urgotpa	
urmtyp	Claim type
urquitp	Penalty for voluntary quit
urrpeat	Repeat claim flag
urstart	Week claim established
urtpcng	Type change flag
urtrnbr	Training benefit weekly rate
urtrnwk	Weeks of training benefits
uruer	Local unemployment rate (x10)
urweeks	Claim weeks of benefits
urwkhr	Weekly hours of work
urwork	Weeks of work prior to claim
ury1	
ury2	
ury3	
ury4	
ury5	
wrwgt	Household weight (float)

CANCELFLAG	Cancellation request flag
DBVERSION	Version of the database (x100)
WGTTOT	Sum of weights on tax file

OUTPUT VARIABLES:

fhash	Hashed code of header information
hdbdrms	Number of bedrooms
hdclohh	Number of SCF clones
hdnpers	Number of persons in household
hdprov	Province
hdroom	Number of rooms
hdseqhh	Household sequence number
hdtenur	Tenure
hdurb	Size of urban area
hdwgthh	Household weight
hhnin	Number of individuals in household
idadded	Additional deductions from net income (256)
idage	Age
idalexp	Other allowable employment expenses (229)
idcapgex	Capital gains exemptions (254)
idcarry	Carrying charges (221)
idccet	Child care expenses associated with child
idccett	Child care expenses (Limit A, Form T778)
idccqp	Converted CPP/CQP benefit
idcfpub	SCF CF publication flag
idcfrh	Relationship to census family head
idcfseq	Census family sub-sequence number
idcharit	Charitable donations (340)
idcintim	Converted interest income (imputed)
idcross	Allowable other years capital loss (253)
idcluflg	Common-Law union flag
idcsa	Converted social assistance
idcuib	Converted UI benefit
iddalimo	Alimony paid (220)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
iddues	Union and professional dues (212)
idedlev	Educational level
ideducm	Eligible months of education allowance
idefpub	SCF EF publication flag
idefhrh	Relationship to economic family head
idefseq	Economic family sub-sequence number
idemplo	Employee home relocation loan dedn (248)
idestat	Educational status
idexplor	Exploration and development expenses (224)
idext	Extra numbers [array]
idfdsft	Foreign tax credit applied to surtax (511)
idforavg	Forward averaging amount withdrawal (237)
idforinc	Net foreign income (508)
idfortx	Foreign tax paid (507)
idgifts	Gifts to Canada/provinces/culture (342)
idgstreb	GST rebate (457)
idhhrh	Relationship to head of household
idhomstu	College res/resdnt homeowner assist (558)
idhosslf	Hosp. contributions - self (598)
idhospo	Hosp. contributions - spouse (599)
idialimo	Alimony income received

idicapg	Capital gains (actual)
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idieflag	Cloned institutionalized elderly person
idiemp	Wages & salaries
idiint	Interest income (121)
idiloss	Business investment losses (217)
idimmi	Years since immigration
idind	Industry
idinogv	Other government income (non-taxable)
idinoth	Other money income (non-taxable)
idinseq	Individual sub-sequence number
idioinv	Other investment income with net rental
idipens	Pension income (115)
idisa	Social assistance income
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditc	Federal investment tax credits (412)
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
iditrrsp	Taxable RRSP withdrawals
idivetp	Veterans pensions and allowances
idiworkc	Workers compensation benefits
idlabtsg	Gross Labour funds bought (413)
idlfst	Labour force status
idlyfp	Last year full/Part time
idlystr	Last year stretches unemployed
idlyun	Weeks unemployed
idlyww	Weeks worked
idmarst	Marital status
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idmovexp	Imputed moving expenses (219)
idmschpd	Manitoba school taxes paid
idnage	Age
idnclos	Allowable other years non-capital loss (252)
idninco	No income flag (SPSD variables)
idnonlf	Major non-LF activity
idnorth	Northern deductions (255)
idocc	Occupation
idothded	Other deductions from total income (232)
idothpe	Other dependant exemptions (305)
idpartlo	Limited partnership losses (251)
idpolcon	Federal political contributions (409)
idproptx	Net property taxes paid (556)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)
idrentpd	Total rental payments (555)
idrkyun	Raking foundation: weeks unemployed
idrkyww	Raking foundation: weeks worked
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idsapred	Predicted amount of SA received
idsarank	Predicted ranked likelihood of getting SA
idscfcqp	CPP/QPP income (SCF)
idscfctc	Child tax credit
idscfflg	SCF high-income preservation flag

idscfftc	Federal tax credit
idscfint	Interest income (SCF)
idscfoas	Old age security
idscfptc	Provincial tax credits as reported on SCF
idscfsa	Social assistance income (SCF)
idscfuib	Unemployment insurance benefits
idschtp	School type
idsex	Sex
idstkded	Stock option deduction (249)
idsynthi	Synthetic high income person
idtuitn	Tuition fees (320)
iduipead	Predicted amount of UI received
iduirank	Predicted ranked likelihood of getting UI
idvencap	Venture capital tax credit (564)
ucbtyp	Claim type
uceff	Effective weekly rate
ucern	Insurable weekly earnings
ucexhas	Exhaustee flag
ucgotpa	Received paternity benefits
ucmtyp	Main Claim type (majority of weeks)
ucquitp	Penalty for voluntary quit
ucrpeat	Repeat claim flag
ucstart	Week claim established
ucstat	Claim status flag
uctpcng	Also received regular benefits
uctrnbr	Training benefit weekly rate
uctrnwk	Weeks of training benefits
ucuer	Local unemployment rate (x10)
ucuero	Local unemployment rate (x10)-original value
ucweeks	Weeks of benefits
ucwkhr	Weekly hours of work
ucwork	Weeks of work prior to claim
ucy1	Weeks on UI in first year before claim
ucy2	Weeks on UI in second year prior to claim
ucy3	Weeks on UI in third year prior to claim
ucy4	Weeks on UI in fourth year prior to claim
ucy5	Weeks on UI in fifth year prior to claim

gai Compute new refundable credits or guarantees

SUMMARY

This is a stub function for use by glass-box users who wish to incorporate a new program that does not affect current programs in the tax system (i.e. a new refundable tax credit). It is called by drv after all taxes have been calculated.

CROSS REFERENCE

Function	Description
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INPUT VARIABLES:

hhnin	Number of individuals in household
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OUTPUT VARIABLES:

imiosa	Other SA or guarantees
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gis	Compute GIS/SPA for elderly
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SUMMARY

The Guaranteed Income Supplementation and Spouse's Allowance programs provide non-taxable monthly benefits to all Canadians age 65 and over who apply and meet the Canadian residency requirements. The program is income tested. The SPSM gis function is based on the age of the individual and the years since immigration as reported at the time of the SCF survey in April 1985 as well as family net income and family type. The function can calculate GIS, SPA, Extended SPA, and Widowed SPA benefits. The functions contain one sub-function, gissub, which calculates the income on which GIS/SPA benefits are tested.

The GIS/SPA benefits are zeroed out if the Seniors Benefit is turned on. When activated, the Seniors Benefit takes precedence over OAS/GIS. Persons age 60 or over in May 1996 may elect to receive OAS/GIS rather than the seniors benefits if their benefits are higher.

Program Description

The Guaranteed Income Supplement is a monthly, non-taxable, income tested benefit paid to residents of Canada who are in receipt of a basic Old Age Security pension. Recipients must re-apply annually. The Guaranteed Income Supplement is not payable outside of Canada for periods of longer than six months. Income testing is based on net income as defined for income tax purposes with the exception of Old Age Security benefits. In the case of a married couple, including common-law, the combined income of the pensioner and his or her spouse is taken into account. Where the individual or couple have an income above a specified amount, the Guaranteed Income Supplement is reduced at a rate of either \$1 for every \$2 of income, or \$1 for every \$4 of income, dependent upon the individuals' marital status and the benefit status of their spouses (if present).

The Guaranteed Income Supplement was established in 1966 to provide monthly benefits to

OAS pensioners born on or before December 31, 1910, whose income is below a specified amount. For 1967, the monthly benefit was \$40 and set at 40 percent of the OAS pension thereafter. The Guaranteed Income Supplement has been changed on various occasions, the most important of which were as follows: 1970, which extended GIS to all OAS beneficiaries who met the income criterion; 1972, provided for annual indexation of GIS based on the CPI; 1973, changed indexation to quarterly from annual; 1977, provided the payment of GIS to partial OAS recipients; 1984, provided an increase in maximum GIS benefits to recipients of partial OAS pensions in the amount of the difference between full and partial OAS benefits.

The Spouse's Allowance is a monthly benefit designed to recognize the difficult circumstances faced by those couples living on the pension of only one spouse, and by many widowed persons. The Allowance is payable to the 60 to 64 year old spouse of an Old Age Security pensioner as well as to any low-income widow or widower age 60 to 64, providing the potential recipient has been a resident of Canada for at least 10 years after reaching age 18. This benefit is income-tested based upon the combined income of both the beneficiary and his/her spouse and must be re-applied for annually. Benefits are not considered as income for income tax purposes and are not payable outside Canada for periods of more than six months.

The Spouse's Allowance came into effect October 1, 1975 and provided for the payment of benefits to persons aged 60 to 64 inclusive who are married to and living with an OAS pensioner. The amount was set at a sum equal to the monthly OAS pension plus the maximum monthly GIS at the married rate. Significant changes to the Spouse's Allowance were made in 1977 with the provision for partial Spouse's Allowance using the same criterion as for OAS; 1979, the extension of the Spouse's Allowance to include surviving spouses of deceased Old Age Security pensioners; 1985, with the provision for Spouse's Allowance to be paid to all widows/widowers age 60 to 64 regardless of deceased spouse's prior pension status.

The GIS, and SPA programs have been designed with the overall income of elderly Canadians in mind and ensure that no OAS pensioner, full or partial, will receive benefits less than the equivalent of a full OAS pension. Because the programs are interrelated, a better understanding is facilitated by discussing them together across the five different family types listed below and discussed in turn. These categories define the basic structure of the SPSM implementation of these programs. In these descriptions pensioner is understood to mean a recipient of either full or partial OAS benefits.

GIS/SPA Type	Family Status
1. Single Pensioner:	Unattached Individual, OAS Pensioner
2. Widowed Pensioner:	Unattached Individual, Age 60-64, Widowed
3. Married 2 Pensioner:	Married Couple, Both OAS pensioners
4. Married pensioner with SPA spouse:	Married Couple, OAS Pensioner with SPA recipient
5. Married pensioner with non-pensioner spouse:	Married couple, 1 OAS pensioner, spouse ineligible for OAS or SPA

Single Pensioner

If an individual is receiving a full Old Age Security Pension he or she may be eligible for the federal Guaranteed Income Supplement (GIS). GIS is an income tested benefit payable to OAS beneficiaries with little or no income beyond to the basic OAS benefit. In the case where a beneficiary of a full OAS pension has no additional income or income of up to a maximum of \$24 per year, his/her GIS benefit will be the maximum. For every two dollars of income in excess of \$24 annually, the GIS benefit is reduced by one dollar until the benefit is reduced to zero.

In the case where the beneficiary is eligible for only partial OAS benefits, but has little or no other income (again, to a maximum of \$24 per year), supplementary GIS is available. Supplementary GIS makes up the difference between the partial OAS benefit that the beneficiary is receiving and full OAS benefits. Thus, a beneficiary with 20 years of residence in Canada would receive 30/40 of a full OAS pension and supplementary GIS benefits up to an amount equivalent to 10/40 of a full OAS pension. This ensures that no OAS pensioner, full or partial, will receive benefits less than the equivalent of a full OAS pension. In addition to the partial OAS pension and the supplementary GIS benefits, an individual may also receive the regular GIS benefit. Both the regular and the supplementary GIS benefits are income tested and reduced at a rate of one dollar for every two dollars of income in excess of \$24 per year.

Widowed pensioner

The Spouse's Allowance is an income-tested benefit payable to individuals who are between 60 and 65 years of age and are spouses of Old Age Security beneficiaries. In order to qualify for this benefit, the applicant must meet the same residence requirements set out for the basic Old Age Security Pension. The guarantee for the benefit is equivalent to the sum of the full basic Old Age Security Pension plus the Guaranteed Income Supplement at the married rate. This benefit is reduced by \$3 for every \$4 of the beneficiary's monthly income or the couple's combined monthly income until the OAS-equivalent is reduced to zero. At that point the GIS portion reduces at the rate of \$1 for every \$4 of combined income until benefits are reduced to zero.

If an individual receiving Spouse's Allowance becomes a widow or widower, they are then eligible for an Extended Spouse's Allowance until they reach the age of 65 at which time they will become eligible for a basic Old Age Security Pension and the Guaranteed Income Supplement. The amount of the Extended Spouse's Allowance is somewhat higher than the regular Spouse's Allowance to account for the fact that the beneficiary is now in a single income family.

In addition to the regular and Extended Spouse's Allowances, benefits exist for widows and widowers between 60 and 65 years of age whose spouse died prior to becoming a pensioner. The Widowed Spouse's Allowance pays benefits at the same rate as the Extended Spouse's Allowance. Both the Extended and Widowed Spouse's Allowances are reduced by \$3 for every \$4 of monthly income until the OAS-equivalent portion is reduced to zero and then by \$1 for every additional \$2 of monthly income until the GIS-equivalent portion is reduced to

zero.

The Spouse's Allowance is not considered as income for income tax purposes but may, however, affect taxes indirectly via the spousal exemption amount.

Married Couple, Both Pensioners

GIS eligibility for couples is first based upon receipt of OAS. If the applicant is not eligible for OAS, then he or she is not eligible for GIS. Once eligibility for GIS has been established, then the rate of recovery or rate at which GIS is reduced because of additional income, must be established. For two pensioner couples, where both are OAS beneficiaries, GIS is reduced by one dollar for every four dollars of the couple's combined monthly income in excess of \$48 per year. In 1984, the maximum regular GIS payable to a married beneficiary was less than that payable to a single beneficiary. As in the case of a single beneficiary receiving only partial OAS benefits, a supplementary GIS benefit is available which makes up the difference between partial and full OAS benefits.

Married Pensioner with SPA Spouse

GIS is payable to the pensioner at the same rate as is paid to an individual in married couple where both spouses are pensioners. The amount of SPA benefit is equivalent to the combination of the full basic Old Age Security Pension and Guaranteed Income Supplement at the married rate. This benefit is reduced by \$3 for every \$4 of combined monthly income (75%) until the OAS-equivalent is reduced to zero. At that point both the remaining portion of the Spouse's Allowance, and the pensioner's Guaranteed Income Supplement are each reduced by \$1 for every additional \$4 (50%) of the couple's combined monthly income.

The benefits payable to a pensioner with a given income could vary depending on whether the couple had applied for SPA; the benefit being higher for single pensioner couples. To ensure benefits are equal in these cases the SPA couple's benefits begin to be reduced at the effective rate of 25%, \$1 for each \$4 of family income after the crossover point. This is done by holding the pensioner's benefits fixed from the crossover point until the SPA benefits are reduced to zero; then the pensioners benefits continue to be reduced at the same married rate (see following figure).

GIS and SPA For Married Couples, 1 is not an OAS Pensioner

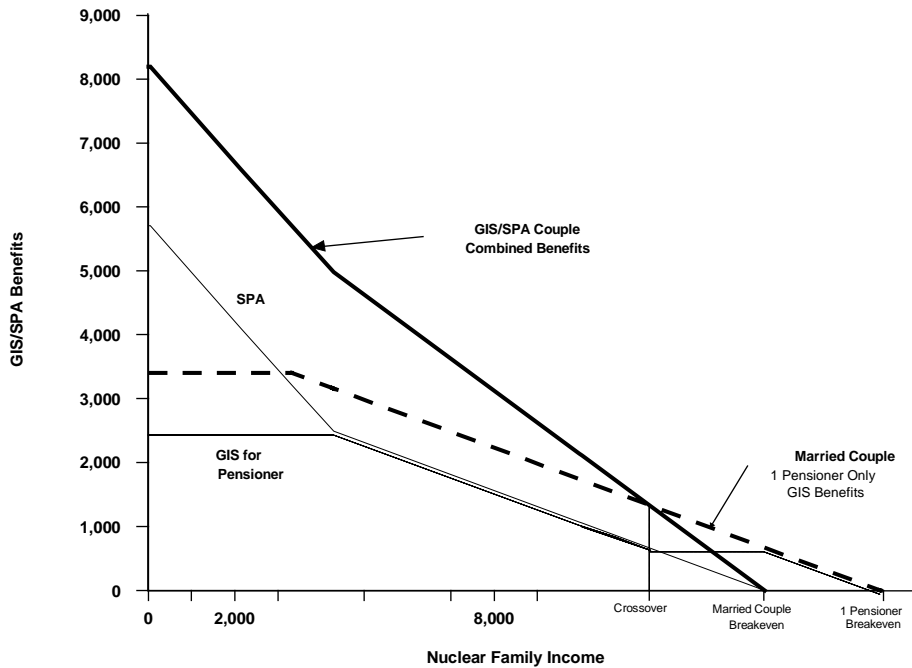


Figure 2 GIS/SPA Benefits for Married Pensioner with Non-Pensioner Spouse

Married Pensioner with Non-Pensioner Spouse

In the case of a pensioner whose spouse is under 60 years of age or is a recent immigrant, and therefore not eligible for OAS, GIS or SPA, the pensioner receives GIS at the higher single rate and benefits are reduced \$1 for every \$4 of the couple's combined monthly income with the first reduction being made only when their combined monthly income exceeds an amount equivalent to basic OAS plus \$4 per month. (see figure above)

SPSM Implementation

The gis function determines benefits based on the age of the individual, the years since immigration as reported at the time of the SCF survey in April 1985, combined family income, and family type. The function makes use of the imoasres, imoaspar variables created in the oas function to determine residential eligibility.

The function initially performs some screenings and pointer assignments for efficiency, and then makes a call to the gissub function to determine the previous years income, which will be used when calculating GIS/SPA benefits. This sub-function adds together all the components of total income listed below and multiplies them by a deflator PYINC to estimate the value of the previous year's income.

Net Income = PYINC *	Deflator To Simulate Previous Years Income
imicapgt	Taxable Capital Gains
+ imidivt	Dividends Received
+ idiint	Investment Income

+ idiemp	Employment Income
+ idisenf	Non-Farm Self Employment Income
+ idisefm	Farm Self Employment Income
+ idioinv	Other Investment Income
+ iditoh	Other Income
+ idicqp	CPP/QPP Benefits
+ idipens	Private Pension Income
+ iditogv	Other Taxable Government Transfers
+ imiuib	Unemployment Insurance Benefits
- imalexp	Other allowable Employment Expenses
- imcqppc	CPP/QPP Contributions
- imuic	Unemployment Insurance Contributions

The last three deductions can be excluded from the calculation of income by setting GISPTDFLAG to 0. Benefits are then calculated in each of the five groups discussed above. Every individual is assigned a value for the variables imoldtyp and imgistyp which define the type of pensioner couple and are used in the gist function.

The GIS supplement for the OAS shortfall for immigrants is calculated conditional on the setting of GISOASFLAG in all cases except the SPA recipient in a married couple. This should be set to one in years 1984 and later. No adjustment is made to account for the first quarter in 1984 for which no shortfall adjustment was made.

Take-up rates for GIS and SPA benefits are optionally applied depending on the value of the GISTURFLAG parameter. The rates are applied to individuals and to one spouse of a married couple. The algorithm assumes that the take-up rate look-up table margins are all dollar denominated GIS or SPA benefit levels.

Take-up rates for extended SPA may be applied by setting the value of SPAEFLAG to one. The two look-up tables SPAME and SPAFE are used to determine whether a widowed person aged 60 to 64 years would have had a spouse receiving OAS at the time of that spouse's death and consequently be eligible for Extended SPA.

When GISPTDFLAG is set to 1, imalexp, imcqppc, imuic are not reduced from the net income definition as proposed in the 1998 budget. This proposal was later withdrawn.

Relation to Other SPSM Routines

GIS and SPA depends on the input parameters for basic GIS/SPA benefits and various variables calculated in the oas function. The function also makes use of parameters derived in the mpc function. The mpc function also ensures that GIS is not calculated without OAS being calculated first. The calculation of OAS and other modeled variables occurs prior to and effects the calculation of GIS and related GIS 'top-up' programs in the gist function. The gist function is called after txprov (calculation of provincial income taxes) by drv and as such has no impact on the personal income tax system.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BESPA	Basic GIS portion of extended SPA
BGISM	Basic GIS - married
BGISS	Basic GIS - single
BOAS	Basic OAS
ESPAT	Extended SPA take-up rate by benefit level [benefit,rate]
GISBE2	Breakeven for GIS/SPA couple
GISCT	GIS take-up rate: pensioner couple by benefit level
[benefit,rate]	
GISFLAG	Federal GIS/SPA/ESPA flag
GISOASFLAG	1984 GIS top-up to OAS residence shortfall flag
GISOT	GIS take-up rate: one pensioner couple by benefit level
[benefit,rate]	
GISPTDFLAG	GIS income: Payroll tax deduction flag
GISRLM	Basic GIS reduction level: married pensioners
GISRLS	Basic GIS reduction level: single pensioners
GISRRM	Basic GIS reduction rate: married pensioners
GISRRS	Basic GIS reduction rate: single pensioners
GISST	GIS take-up rate: single pensioner by benefit level
[benefit,rate]	
GISTURFLAG	GIS take-up flag: apply 5 take-up tables
PYINC	Deflator to calculate previous year income
SBFLAG	Activate calculation of Seniors Benefit
SBOPTFLAG	Optimize Seniors benefit with OAS/GIS
SPAFLAG	Extended SPA eligibility probabilities flag
SPAFE	SPA take-up rate: eligible female widow [age,probability]
SPAME	SPA take-up rate: eligible male widower [age,probability]
SPAASRR	OAS portion of SPA taxback rate
SPARL	SPA reduction point: one married/ widowed
SPAT	SPA take-up rate by benefit level [benefit,rate]
SPAXO	Benefit Cross-over GIS/SPA vs GIS one pensioner couple
INPUT VARIABLES:	
hhnnf	Number of nuclear families in household
idage	Age
idicqp	CPP/QPP income (114)
idiemp	Wages & salaries
idiint	Interest income (121)
idioinv	Other investment income with net rental
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
iditrsp	Taxable RRSP withdrawals
idmarst	Marital status
idrand	Random numbers [array]
idsex	Sex

imalexp	Allowable employment expenses
imcqqpc	CPP/QPP contributions
imicapgt	Capital gains (taxable)
imidivt	Dividend income (taxable)
imioas	OAS benefits
imiuib	Unemployment Insurance/Employment Insurance benefits
imoaspar	Partial OAS residency flag
imoasres	Partial OAS fraction
imsbz	Is Seniors Benefit Zeroed?
imuic	UIC contributions
nfageeld	Age of eldest in nuclear family
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imgisinc	Individual's income for GIS/SPA reduction
imgismax	Maximum amount of GIS
imgistyp	Type of GIS entitlement
imigis	GIS benefits
imispa	Spouse's allowance
imninc	No income flag
imoldtyp	Type of GIS/SPA nuclear family
imspamax	Maximum amount of SPA
imspatyp	Type of SPA entitlement

gist Compute Provincial GIS top-ups for elderly

SUMMARY

The gist function calculates benefits for eight provincial GIS supplementation programs in eight provinces; Newfoundland, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. The function requires that both OAS and GIS be calculated first. All provincial senior's programs within SPSM are in this function. Please note that the provincial programs here are not exhaustive, but all major benefits are covered.

The calculation procedure were modified to allow the program to be triggered by Federal Senior benefits.

Program Description

Eight provinces provide cash benefits to pensioners in receipt of federal OAS, GIS, and in some cases, SPA benefits. The eight programs differ in terms of the level of benefits payable, eligibility requirements, etc. Each program listed below is modeled and documented independently.

Newfoundland	Low-income Seniors Benefit
Nova Scotia	Special Social Assistance
New Brunswick	Low-income Seniors Benefit

Ontario	Guaranteed Annual Income System (GAINS-A)
Ontario	Sales Tax Grant Program
Ontario	Property Tax Grant Program
Manitoba	Supplement for Pensioners (55+)
Saskatchewan	Income Plan (SIP)
Alberta	Assured Income Plan AAIP
Alberta	Alberta Seniors Benefit
Alberta	Widow's Pension
British Columbia	GAIN for Seniors Supplement (Guaranteed Available Income for Need)

Newfoundland Low-Income Seniors Benefit

A benefit is given to seniors (aged 65 and over) with annual family income less than NFSBTD. The maximum benefit NFSBBAS is reduced by NFSBRR for each dollar of family income over NFSBTD.

Nova Scotia Special Social Assistance

Up to 1991, all residents of the province of Nova Scotia who are in receipt of GIS in March of a given year were eligible for Special Social Assistance. Application for benefits had to be made each year. SPA recipients were not eligible. One lump-sum payment was made yearly in one of four amounts scaled to the proportional GIS of the recipient as follows:

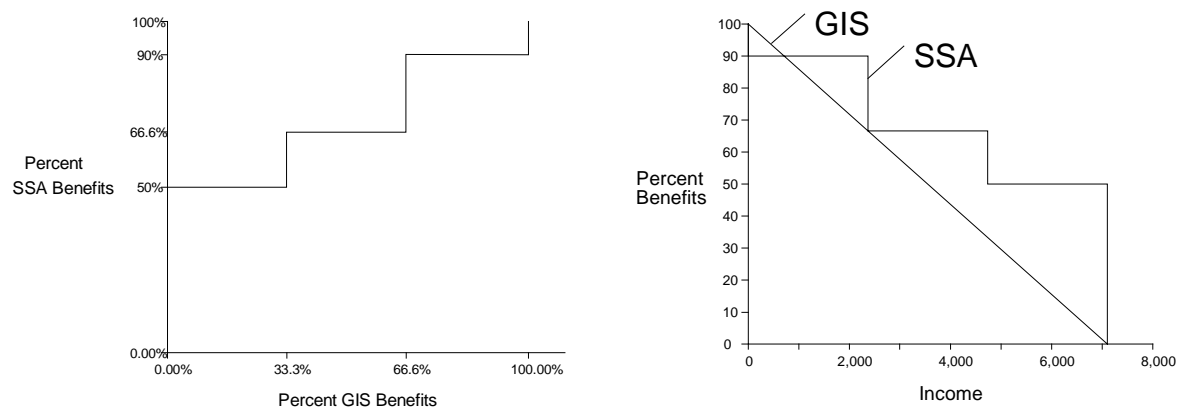


Figure 3. Nova Scotia Special Social Assistance

So, for example, a pensioner receiving maximum GIS benefits would have received maximum SSA benefits and a pensioner receiving 80% of maximum GIS benefits would have received 90% of maximum SSA benefits.

New Brunswick Low-Income Seniors Benefit

A benefit is given to seniors who receive GIS. If both spouses received GIS, the benefit is given to the spouse with the lower net income.

Ontario Guaranteed Annual Income System (GAINS-A)

GAINS-A provides a monthly benefit to Ontario residents in receipt of GIS who meet certain income and residence requirements. A person must have lived in Ontario for the year prior to applying for GAINS-A or for at least 20 years after turning 18 years of age. GIS recipients need not apply since their eligibility is reviewed automatically. SPA recipients are not eligible. There are two levels of benefits, single and married. Benefits are reduced at the same rate as GIS.

Ontario Sales Tax Grant Program

The sales tax grant has been a flat \$50 per person over age 65 from 1984 to 1989. The maximum value of the sales tax grant is stored in the ONTSTG parameter. The variable *impstg* is used to store individual sales tax grants calculated by the model.

Ontario Property Tax Grant Program

The property tax grant is payable to seniors who are head of their household. The amount of the grant varies by tenure and actual costs. For years 1984 to 1989 renters receive 20% of their rental costs up to a maximum of \$500. Homeowners receive the maximum benefit. The fraction of rental costs allowed is contained in the ONTFPTG parameter while the maximum benefit is stored in the parameter ONTPPTG. Calculated benefits are stored in the variable *impptg*.

Calculated benefits for both the sales tax grants and the property tax grants are also added to the variable *imigist*.

Manitoba Supplement for Pensioners (MSP, 55+)

The MSP provides quarterly benefits to Manitoba residents who are in receipt of certain levels of GIS and SPA benefits, including extended and widowed SPA recipients. MSP also provides benefits to persons aged 55 and over who are not in receipt of OAS benefits but whose income falls in a specified range and is derived at least 50% from pension sources. Eligibility is renewed automatically for GIS and SPA recipients, but non-GIS/SPA pensioners 55 years of age and over must apply.

In the case of GIS/SPA recipients there are two levels of benefits, single and married. An SPA recipient is treated as a single pensioner. Benefits are reduced at the same rate as GIS based on family income. Non GIS/SPA pensioners are treated in exactly the same manner except for couples benefits are reduced based on individual annual income.

Saskatchewan Income Plan

SIP provides monthly benefits to Saskatchewan residents in receipt of GIS and whose incomes don't exceed specified levels. SPA recipients are not eligible for SIP benefits. There are two levels of benefits, single and married. There are three different reduction rates. Unattached Individuals and Married Couples where both are GIS pensioners SIP benefits are reduced by \$1 for each \$1 reduction in GIS. For a pensioner whose spouse is not eligible for OAS/GIS/SPA the benefit is reduced by \$3 for each \$1 reduction in GIS benefits. The pensioner spouse of an SPA recipient has their benefit reduced by \$1 for each \$3 reduction in

their spouse's SPA. There are monthly minimum benefits at both single and married levels.

Alberta Assured Income Plan

AAIP benefits are payable monthly to all Alberta residents who are in receipt of GIS benefits or who became eligible for the extended SPA prior to May 1983. Regular SPA recipients are ineligible. Since May 1983 all extended SPA recipients are referred to the Alberta Widow's pension. Application is not required. There is one individual benefit which is reduced by 50¢ for each \$1 reduction in GIS benefits to a minimum of \$10 monthly.

Alberta Seniors Benefit

Starting in 1994, the AAIP was replaced by the Alberta Seniors Benefit. When ALTAOPT is set to 2, the Alberta Seniors Benefit is calculated. Seniors are split into six categories:

single seniors who rent their home,
single seniors who own their home,
seniors married to non-seniors who rent their home,
seniors married to non-seniors who own their home,
two senior couples who rent their home,
and two senior couples who own their home

When ASBSSOPT is set to 2, seniors married to non-seniors are treated in the same manner as two senior couples. Benefits and reduction rates vary by these categories (ASBBASIC, ASBRENT, ASBSS, ASBNSS, ASBRR). Maximum benefits are phased out using non-deductible income which is defined as last year's total income (imitot) minus OAS benefits (imioas), registered pension plan contributions (idrpp), RRSP contributions (idrrsp), and ASBEMP times idiemp.

For persons who do not qualify for OAS because of residency requirements, a proportion of the total benefit is assigned depending on marital status and household tenure (ASBNOAS). For these persons, BOAS is deducted from their non-deductible income. When ASBSSOPT is set to 1, a two senior couple in which one of the seniors does not meet the OAS eligibility requirement is treated as 1 senior couple.

Alberta Widowed Pension

The Alberta Widow's pension provides monthly benefits to widows and widowers aged 55 to 64 years who reside in Alberta. Yearly Application must be made. Maximum benefits are reduced by \$1 for each \$1 of previous year's non-exempt annual income. Extended SPA recipients may apply however their SPA benefits are included in their income when calculating entitlement.

British Columbia GAIN for Seniors Supplement

GAIN provides a monthly benefit to British Columbia residents in receipt of GIS or SPA who meet certain income and residence requirements. GIS/SPA recipients need not apply since their eligibility is reviewed automatically. There are two levels of benefits, single and

married. Benefits are reduced at the same rate as GIS.

SPSM Implementation

The user is invited to read the source code in order to examine the implementation of these programs. A subsequent update will include a written description of the implementation of these programs.

Interpretation

In general the problems of coverage, including take-up, discussed in the interpretation of OAS and GIS are also present here. Specifically there are no tests made for residential eligibility applied on Ontario GAINS-A. Currently double counting occurs for the benefits for Manitoba residents under the age of 65. This is because the calculated income is reported in one variable (imigist) and reported income from the survey is reported in another (imisa). There are plans to fix the problem; however, the dollar amounts are small in any case.

Relation to Other SPSM Routines

Provincial GIS supplement programs depend on various program specific input parameters as well as variables calculated in the oas and gis functions. The mpc function ensures that provincial GIS supplements are not calculated without GIS being calculated first. The calculation of OAS and GIS occurs prior to and effects the calculation GIS 'top-up' programs in the gist function. The gist function is called after gis by drv and as such has no impact on the personal income tax system.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ALTAMIN	Alberta GIS supplement minimum annual benefit
ALTASC	Alberta GIS supplement maximum annual benefit
ALTASOPT	Alberta seniors option [1=GIST,2=new seniors benefit 1994]
ALTAWP	Alberta widow's pension maximum annual benefit
ASBBASIC	Alberta seniors benefit annual basic benefit
ASBEMP	Alberta seniors benefit employment inclusion rate
ASBNOAS	Alberta seniors benefit reduction if no OAS [senior type]
ASBNSS	Alberta seniors benefit non-senior spouse supplement
ASBRENT	Alberta seniors benefit renter supplement
ASBRR	Alberta seniors benefit reduction rate [senior type]
ASBSS	Alberta seniors benefit senior spouse supplement
ASBSSOPT	Alberta seniors benefit 1 senior couple option [1=model separately,2=model as senior couples]
BCC	British Columbia GIS supplement: married pensioners
BCS	British Columbia GIS supplement: single pensioners
BOAS	Basic OAS

GISRLM	Basic GIS reduction level: married pensioners
GISTFLAG	Provincial GIS top-up flag
MANC	Manitoba GIS supplement: married pensioners
MANCNPF	Manitoba GIS supplement reduction point: married
MANS	Manitoba GIS supplement: single pensioners
MANSNPF	Manitoba GIS supplement reduction point: single
NBSB	New Brunswick Low-Income Seniors' Benefit
NFSBBAS	NFLD Low-Income Seniors' Benefit base amount
NFSBRR	NFLD Low-Income Seniors' Benefit reduction rate
NFSBTD	NFLD Low-Income Seniors' Benefit turndown
NS13	Nova Scotia GIS supplement for 1/3 GIS
NS23	Nova Scotia GIS supplement for 2/3 GIS
NSLT13	Nova Scotia GIS supplement for less than 1/3 GIS
NSMAX	Nova Scotia maximum GIS supplement level
ONTC	Ontario GIS supplement: married pensioners
ONTFPTG	Ontario property tax grant (fraction of rent)
ONTPTG	Ontario property tax grant for seniors
ONTS	Ontario GIS supplement: single pensioners
ONTSTG	Ontario sales tax grant for seniors
PYINC	Deflator to calculate previous year income
SASKC	Saskatchewan GIS supplement: married pensioners
SASKMINC	Saskatchewan GIS supplement minimum benefits: married
SASKMINS	Saskatchewan GIS supplement minimum benefits: single
SASKRR1	Saskatchewan GIS supplement reduction rate: regular
SASKRR2	Saskatchewan GIS supplement reduction rate: 1 GIS
SASKRR3	Saskatchewan GIS supplement reduction rate: SPA
SASKS	Saskatchewan GIS supplement: single pensioners
TARGETYEAR	Year of analysis

INPUT VARIABLES:

hdageeld	Age of eldest in household
hdprov	Province
hdtenur	Tenure
hnnin	Number of individuals in household
idage	Age
idcfrh	Relationship to census family head
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idieflag	Cloned institutionalized elderly person
idiemp	Wages & salaries
idiint	Interest income (121)
idinspo	Person's spouse [pointer]
idioinv	Other investment income with net rental
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
iditrrsp	Taxable RRSP withdrawals
idmarst	Marital status
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idspoflg	Person has spouse
imalexp	Allowable employment expenses
imcqpcc	CPP/QPP contributions
imgisinc	Individual's income for GIS/SPA reduction
imgismax	Maximum amount of GIS

imgistyp	Type of GIS entitlement
imicapgt	Capital gains (taxable)
imigis	GIS benefits
iminet	Net income
imioas	OAS benefits
imisbspa	Federal Seniors Benefit SPA
imisenb	Federal Seniors Benefit
imispa	Spouse's allowance
imitot	Total income
imiuib	Unemployment Insurance/Employment Insurance benefits
imoasres	Partial OAS fraction
imrentpd	Imputed rent paid
imsbmax	Federal Seniors Benefit maximum benefit
imsboas	Federal Seniors Benefit OAS portion
imspamax	Maximum amount of SPA
imspatyp	Type of SPA entitlement
imuic	UIC contributions

OUTPUT VARIABLES:

imiasb	Alberta seniors benefit
imigist	GIS provincial top-up
imninc	No income flag
impptg	Provincial property tax grant for seniors
impstg	Provincial sales tax grant for seniors

isneg Is argument negative ?

SUMMARY

```
int isneg(var);
```

NUMBER var

The isneg function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a NUMBER), and returns a non-zero value if the argument contains a negative value. If the argument is zero or positive, a value of zero is returned. Note that, unlike a function, the isneg macro cannot take an expression as an argument. The expression isneg(var) is functionally equivalent to an expression of the form (var < 0) but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

isnneg Is argument non-negative?

SUMMARY

```
int isnneg(var);
```

NUMBER var;

The `isnneg` function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a `NUMBER`), and returns a non-zero value if the argument contains a non-negative value. If the argument is negative, a value of zero is returned. Note that, unlike a function, the `isnneg` macro cannot take an expression as an argument. The expression `isnneg(var)` is functionally equivalent to an expression of the form `(var > 0)` but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

isnzero Is argument non-zero?

SUMMARY

```
int isnzero(var);
```

```
NUMBER var;
```

The `isnzero` function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a `NUMBER`), and returns a non-zero value if the argument contains a non-zero value. If the argument is zero, a value of zero is returned. Note that, unlike a function, the `isnzero` macro cannot take an expression as an argument. The expression `isnzero(var)` is functionally equivalent to an expression of the form `(var != 0)` but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

iszero Is argument zero?

SUMMARY

```
int iszero(var);
```

```
NUMBER var;
```

The `iszero` function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a `NUMBER`), and returns a non-zero value if the argument contains the value zero. If the argument is non-zero, a value of zero is returned. Note that, unlike a function, the `iszero` macro cannot take an expression as an argument. The expression `iszero(var)` is functionally equivalent to an expression of the form `(var == 0)` but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

SUMMARY

```
NUMBER lkup1(tbl, tblnum, input);  
  
NUMBER tbl[][3];  
int tblnum;  
NUMBER input;
```

The lkup1 function is used to perform table look-ups with interpolation. Expressed another way, lkup1 evaluates continuous piecewise linear functions.

The first argument (tbl) is the address of an SPSM look-up table, which is an n x 3 array of floating point numbers. The first two columns of tbl contain the (X,Y) pairs that define the piece-wise linear function. The third column of tbl contains the slope of the segment that starts at the (X,Y) pair. SPSM look-up tables are defined in parameter input files, and come in two varieties, as perceived by the user. One variety allows the user to specify the (X,Y) pairs, and computes the slopes automatically. The other variety allows the user to specify all the X values, the first Y value, and the slopes, and computes the remaining Y values automatically. In both cases the internal representation of the lookup table is identical and is the same as that expected by the lkup1 function.

The second argument of lkup1 is an integer giving the number of rows in tbl. Generally this value is another member of the same parameter structure in which the tbl is defined.

The third argument of lkup1 is the X value whose corresponding Y value is to be determined. lkup1 returns the corresponding Y value.

SUMMARY

```
NUMBER lkup2(tbl, tblnum, input);  
  
NUMBER tbl[][3];  
int tblnum;  
NUMBER input;
```

The lkup2 function is used to perform table look-ups without interpolation. Expressed another way, lkup2 evaluates step functions.

The first argument (tbl) is the address of an SPSM look-up table, which is an n x 3 array of floating point numbers. The first two columns of tbl contain the (X,Y) pairs that define the left-most point of each step in the step function. The third column of tbl contains the slope of the segment that starts at the (X,Y) pair, but the lkup2 function only makes use of the (X,Y) pairs in the look-up table. The slopes, though always present in look-up tables, are not used.

The second argument of lkup2 is an integer giving the number of rows in tbl. Generally this value is another member of the same parameter structure in which the tbl is defined.

The third argument of lkup2 is the X value whose corresponding Y value is to be determined. lkup2 returns the corresponding Y value.

maxn Find the maximum of two numbers

SUMMARY

NUMBER maxn(x,y);

NUMBER x;

NUMBER y;

The maxn function returns the value of the larger of its two input arguments.

memo1 Compute memo items for reporting

SUMMARY

The memo1 function is used to calculate several reporting variables as aggregates of other modeled variables. The function calculates all dollar denominated reporting variables up to the level of disposable income. In addition taxable filer status is determined.

SPSM Implementation

The memo1 function operates at the individual level of analysis and skips individuals with no income. The algorithm first assigns filer status as relevant/non-relevant and taxable/non-taxable based on taxes paid and credits received. The function then calculates several reporting variables as follows.

Reporting Variable	Formula
imiemp =	idiemp;
imiself =	idisenf + idisefm;
imfoth =	iditogv + idinogv;
impoth =	ZERO;
imicqp =	idicqp;
immemp =	idiemp + idisenf + idisefm;
imminv =	idiint + ididiv + idicapg + idioinv;
immoth =	idipens + iditoth + idinoth;
immmkt =	immemp + imminv + immoth;
imfran =	imffa + imioas + imiotg + imigis + imispa + imisenb + imisbspa + imctc + imfcben + imicqp + imfoth + imiuib + imfstc + imqtar + imfsa + imiosa + imfortc;

imctcben =	imctc + imfcben;
imfothtr =	imfoth + imfortc;
imfnewpg =	imiotg + imiosa;
imigispa =	imigis + imispa;
impfp =	impfa + imqaafa + imqnbfa + imiafetc + imnbcben + imibcfb + imoccea + imqfatc + imscb + imses + imnscb + imibceib;
imptran =	impfp + imigist + imptc + impsa + importc + iminsda;
immtran =	imptran + imftran;
immmtot =	immmkt + immtran;
imftax =	imuic + imcqppc + imrepy + imtxf;
imptax =	imtxp;
immtax =	imftax + imptax;
immdisp =	immmtot - immtax;
immicons =	immdisp; (initial assignment, may be re-assigned in memo2)

Relation to Other SPSM Routines

The `memo1` function is called by `drv` immediately after the income tax and cash transfer algorithms have executed. It is called just before the execution of the commodity tax model (`ctmod`) which makes use of some of the aggregated output variables. The `memo2` function follows `ctmod` to add information to the reporting variables calculated in the `memo1` function.

CROSS REFERENCE

Function	Description
----------	-------------

INPUT VARIABLES:

<code>hhnin</code>	Number of individuals in household
<code>idialimo</code>	Alimony income received
<code>idicapg</code>	Capital gains (actual)
<code>idicqp</code>	CPP/QPP income (114)
<code>ididiv</code>	Dividend income (actual)
<code>idiemp</code>	Wages & salaries
<code>idiint</code>	Interest income (121)
<code>idinogv</code>	Other government income (non-taxable)
<code>idinoth</code>	Other money income (non-taxable)
<code>idioinv</code>	Other investment income with net rental
<code>idipens</code>	Pension income (115)
<code>idisefm</code>	Self-employed income - farming
<code>idisenf</code>	Self-employed income - non-farming
<code>iditogv</code>	Other government income (taxable)
<code>iditoth</code>	Other non-government income (taxable)
<code>idivetp</code>	Veterans pensions and allowances
<code>idiworkc</code>	Workers compensation benefits
<code>imbft</code>	Basic federal tax
<code>imcqppc</code>	CPP/QPP contributions
<code>imctc</code>	Child tax credit
<code>imfcben</code>	Total Federal Child Benefits
<code>imffa</code>	Federal portion of family allowances
<code>imfortc</code>	Federal other refundable tax credits
<code>imfsa</code>	Federal social assistance
<code>imfstc</code>	Federal sales tax credit
<code>imheatrl</code>	Federal relief for heating expenses
<code>imiafetc</code>	Alberta Family Employment Tax Credit Benefits
<code>imibceib</code>	B.C. Earned Income Benefit
<code>imibcfb</code>	B.C. Family Bonus
<code>imigis</code>	GIS benefits
<code>imigist</code>	GIS provincial top-up
<code>iminet</code>	Net income
<code>iminsda</code>	NS Direct Assistance Program
<code>imioas</code>	OAS benefits
<code>imiosa</code>	Other SA or guarantees
<code>imiotg</code>	Other taxable demogrants
<code>imisbspa</code>	Federal Seniors Benefit SPA

imisenb	Federal Seniors Benefit
imispa	Spouse's allowance
imiuib	Unemployment Insurance/Employment Insurance benefits
imnbcben	Total NB child tax Benefits
imncb	Newfoundland Child Benefit
imninc	No income flag
imnscb	Nova Scotia Child Benefit
imoccea	Ont. Child Care Exp. credit allowed (Family)
impfa	Provincial family allowance
importc	Other refundable provincial tax credits
impsa	Provincial social assistance
imptc	Refundable provincial tax credits
imqaafa	Quebec Availability Allowance FA Supplement
imqfatc	Quebec Family Allowance Tax Credit
imqnbfa	Quebec newborn Allowance
imqtar	Quebec tax abatement (refundable)
imrepay	Social Benefits Repayments
imscb	Saskatchewan Child Benefit
imses	Saskatchewan Employment Supplement
imtxf	Federal income tax payable
imtxp	Provincial income tax payable
imuic	UIC contributions

OUTPUT VARIABLES:

imctcben	Federal child tax credit and child benefits
imfiler	Taxable filer status
imfnewpg	Federal new programs
imfoth	Federal other government income
imfothtr	Federal other trans income and ref. credits
imftax	Federal taxes
imftran	Federal transfer income
imicqp	CPP/QPP payable
imiemp	Wages and salaries
imigispa	GIS and spouse's allowance
imiself	Total self-employment income
immdisp	Disposable income
immemp	All employment income
immicons	Consumable income
imminv	Investment income
immmkt	Market income
immoth	Other income
immtax	All taxes
immtot	Total income
immtran	All transfer income
impalltc	All refundable provincial tax credits
impfp	Provincial family programs
impoth	Provincial other government income
imptax	Provincial taxes
imptran	Provincial transfer income

SUMMARY

The `memo2` function is used to calculate several reporting variables as aggregates of other modeled variables. The function calculates all dollar denominated reporting variables up to the level of consumable income.

SPSM Implementation

The `memo2` function operates at the individual level of analysis and skips individuals with no income. Aspects of the function are not executed if the commodity tax model has not been run (`CTMOD=0`). The function first adjusts several reporting variables calculated in `memo1` as follows.

Reporting Variable	Formula
<code>imftax =</code>	<code>imftax + imtxfc</code>
<code>imptax =</code>	<code>imptax + imtxpc</code>
<code>immtax =</code>	<code>immtax + imtxfc + imtxpc</code>
<code>immicons =</code>	<code>immdisp - imtxfc - imtxpc</code>

The function next calculates additional reporting variables as follows.

Reporting Variable	Formula
<code>immnettr =</code>	<code>immtran - immtax</code>
<code>imothrep =</code>	<code>imrepay - imuibr</code>
<code>imqta =</code>	<code>imqtaa + imqtar</code>
<code>imfedbal =</code>	<code>imftax - imftran</code>
<code>imprvbal =</code>	<code>imptax - imptran</code>
<code>impovinc =</code>	<code>immtot - imctc - imfstc</code>

Relation to Other SPSM Routines

The `memo2` function is called by `drv` immediately after the commodity tax algorithms (`ctmod`) have executed. The function adds information to the reporting variables calculated in the `memo1` function.

Please refer to the [Variable Guide](#) for detailed descriptions of the variables listed above.

CROSS REFERENCE

Function Description

INPUT PARAMETERS:

CTFLAG Commodity tax activation flag

INPUT VARIABLES:

hhnin Number of individuals in household
imftran Federal transfer income
immdisp Disposable income
immtot Total income
immtran All transfer income
imninc No income flag
imptran Provincial transfer income
imqtaa Quebec tax abatement (applied)
imqtar Quebec tax abatement (refundable)
imrepay Social Benefits Repayments
imtxfc Federal commodity taxes
imtxpc Provincial commodity taxes
imuibr UI benefit recovery

OUTPUT VARIABLES:

efin First person in economic family [pointer]
idef Person's economic family [pointer]
imfedbal Federal taxes less transfers
imftax Federal taxes
immicons Consumable income
immtax All taxes
imnettr Net transfers to person
imothrep Other federal repayments
impovinc Income for low income measurement
imprvbal Provincial taxes less transfers
imptax Provincial taxes
imqta Quebec tax abatement (total)

minn Find the minimum of two numbers

SUMMARY

NUMBER minn(x,y);

NUMBER x;

NUMBER y;

The minn function returns the value of the smaller of its two input arguments.

mpc Calculate derived model parameters and do edits

SUMMARY

The mpc function calculates derived model parameters and performs edit checks on input tax/transfer algorithm parameters. The function currently calculates derived parameters for

use in the commodity tax (`ctmod`) function, the Guaranteed Income Supplement (`gis`) function, and the head/spouse transfer (`txhstr`) function. Performing the calculations in `mpe` increases the efficiency of the program by avoiding multiple calculations for every household. Edit checks are performed for aspects of the commodity tax model and the old age income system. Please refer to the appropriate section in the *Algorithm Guide* for details of the specific social and tax programs.

SPSM Implementation

Calculation of Derived Parameters

Two derived parameters for use in the `ctmod` are calculated: a total federal government effective commodity tax rate (CTFTOT) and a total provincial government effective rate (CTPTOT). The federal rate is calculated by adding together the six detailed federal rates produced by the Input/Output model: CTFCID, CTFEXT, CTFMFG, CTFEXT, CTFOEN, and CTFGST. The aggregate provincial rate is calculated in the identical fashion, summing up the 6 provincial rates: CTPRST, CTPLGL, CTPPLQ, CTPTOB, CTPGAS, and CTPAMU.

These parameters are used to ensure equivalent results between the detailed and non-detailed commodity tax model options. When the detailed option is turned off (i.e. the CTDFLAG parameter is set to zero), commodity tax revenues are produced by multiplying the two aggregate rates by the total expenditure of each household. This requires a fraction of the operations for each household when compared to the detailed method.

A single derived parameter, UIBRA, is calculated for use in the `txitax` function. This parameter contains the individual's UIC repayment base amount and is derived from two further parameters: UIBAF, the UI benefit recovery base amount factor, and UIERNMAX, the dollar value of maximum insurable earnings. Please refer to section in this manual for further information on the `txitax` function.

Three derived parameters are calculated for use in the `gis` function. The income breakeven points for GIS/SPA couples and married 1 pensioner couples are calculated here as GISBE1 and GISBE2 respectively. The breakeven points represent the level of family income at which combined GIS/SPA benefits are reduced to zero based on combined family income. They in turn are used to calculate an income crossover point (SPAXO) for the two types of pensioner couples (see following Chart).

GIS and SPA For Married Couples, 1 is not an OAS Pensioner

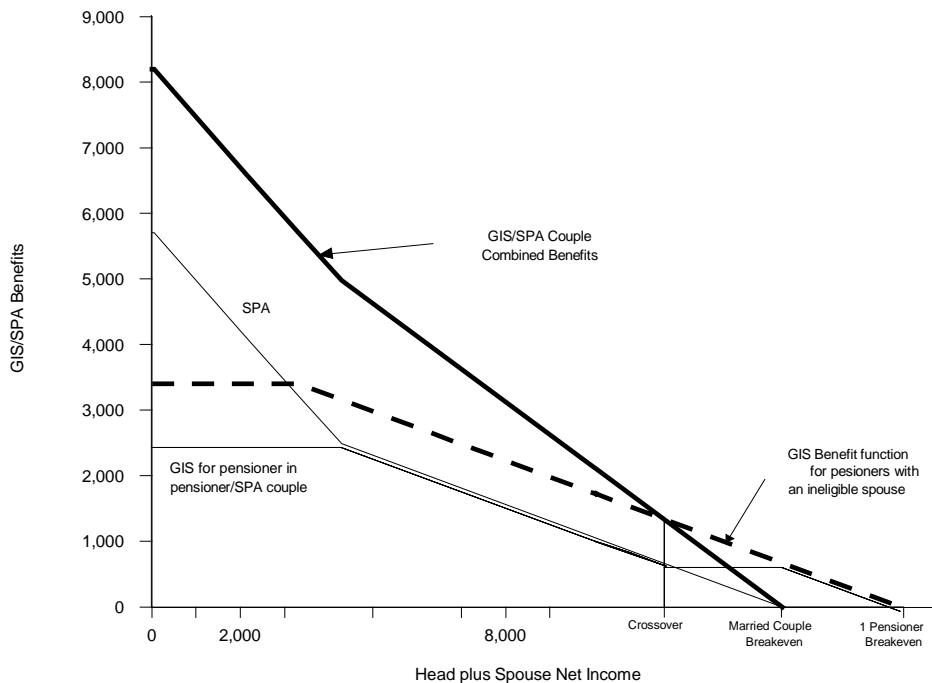


Figure 1 GIS/SPA Benefits for One OAS Pensioner Couples

GISBE1 represents the level of family income at which the GIS benefits of a pensioner married to a non pensioner have been reduced to exactly zero. On the figure above this is the point on the X axis labelled "1 Pensioner Breakeven". The value is calculated as a fixed relationship to other input parameters as follows.

$$\text{GISBE1} = \text{BGISS}/\text{GISRRM} + \text{BOAS} + \text{GISRLS}$$

GISBE2 represents the level of family income at which the combined GIS and SPA benefits of a pensioner married to a SPA recipient have been reduced to exactly zero. On the figure above this is the point on the X axis labelled "Married Couple Breakeven".

$$\text{GISBE2} = (\text{BGISM} * 2) / (\text{GISRRM} * 2) + \text{BOAS} / \text{SPA} + \text{OASRR} + \text{GISRLM}$$

SPAXO represents the level of family income at which the dollar benefits for GIS to a single pensioner married to a non-pensioner spouse exactly equal the combined GIS/SPA dollar benefits payable to a GIS/SPA married couple. On the figure above this is the point on the X axis labelled "Crossover". The value is calculated as a fixed relationship to other input parameters as follows.

$$\text{SPAXO} = 2 * \text{GISBE2} - \text{GISBE1}$$

Please refer to the Guaranteed Income Supplement Section of this guide for further details on the use of these derived parameters.

For all of the parameters described above users may refer to the [Parameter Guide](#) for further information.

Edit Checks

Three parameter edit checks are currently implemented in the `mpc` function.

- If the 1988 tax reform is activated using the `PEROPT` parameter (which controls the treatment of the basic personal exemptions/ tax credits), then a check is made to ensure that the tax credit rate parameter `FNTCR` is non-zero. If zero, an error message is issued but processing continues.
- A similar check is made to ensure that the tax credit rate is non-zero if the Quebec 1988 tax reform is enabled using the `QREFOPT` parameter. Error handling is also the same as above.
- If the `CTFLAG` parameter is set to 1 (thereby specifying that commodity taxes will be calculated) and the `FXVFLAG` parameter is set to 0 (indicating no FAMEX expenditure data is to be read) then an error message will result and `CTFLAG` will be reset to 0 and no commodity taxes will be calculated.
- If the OAS algorithm is switched off (`OASFLAG=0`) and the GIS algorithm is switched on (`GISFLAG=1`) GIS benefits will be incorrectly calculated as they depend on variables calculated in the `oas` function. If this condition is met an error message will result and `GISFLAG` will be set to 0 and consequently no GIS benefits will be calculated.
- If the GIS algorithm is switched off (`GISFLAG=0`) and the provincial GIS supplement algorithm is switched on (`GISTFLAG=1`) provincial GIS supplement benefits will be incorrectly calculated as they depend on variables calculated in the `gis` function. If this condition is met an error message will result and `GISTFLAG` will be set to 0 and consequently no provincial GIS supplement benefits will be calculated.

Relation to Other SPSM Routines

The `mpc` function is called before `drv` and as such is only executed once for every program run. The function currently calculates parameters and performs edits which can effect a number of functions directly; the `ctmod` function, the `gis` function, the `gist` function, the `txitax` function, and the head/spouse transfer `txhstr` function.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
<code>FXVFLAG</code>	Read FAMEX expenditure vector file
<code>BGISM</code>	Basic GIS - married
<code>BGISS</code>	Basic GIS - single
<code>BOAS</code>	Basic OAS
<code>CTFCID</code>	Federal custom import duties [com]
<code>CTFEXD</code>	Federal excise duties [com]

CTFEXT	Federal excise taxes [com]
CTFGST	Federal GST [com]
CTFMFG	Federal manufacturer's sales [com]
CTFOEN	Federal other energy taxes [com]
CTPAMU	Provincial amusement tax [prov]
CTPGAS	Provincial gasoline tax [prov]
CTPLGL	Provincial liquor gallonage tax [prov]
CTPPLQ	Provincial profits on liquor commissions [prov]
CTPRST	Provincial retail sales tax [com x prov]
CTPTOB	Provincial tobacco tax [prov]
FNTCR	Federal non-refundable tax credit rate
GISRLM	Basic GIS reduction level: married pensioners
GISRLS	Basic GIS reduction level: single pensioners
GISRRM	Basic GIS reduction rate: married pensioners
OASFLAG	Old age security flag
PEROPT	Personal exemption/credit option [1=deduction,2=credit]
QNTCR	Quebec nominal tax credit rate
QREFOPT	Quebec deduction/credit option [1=deduction,2=credit]
SPAASRR	OAS portion of SPA taxback rate
UIBAF	UI benefit recovery base amount factor (UI and EI)
UIBAFNR	UI EI benefit recovery base amount factor for non-repeaters (EI only)
UIBASRATE	Benefit rate for basic phase (UI only)
UIEIHWC	EI hours to weeks conversion factor (hours/week) (EI only)
UIEIMFSP	EI Maximum family supplement percent of earnings (EI only)
UIEIOPT	UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
UIERNMAX	Maximum insurable earnings (UI and EI)

OUTPUT PARAMETERS:

CTFLAG	Commodity tax activation flag
CTFTOT	Federal total retail tax equivalent
CTPTOT	Provincial total retail tax equivalent
GISBE1	Breakeven for GIS one pensioner couple
GISBE2	Breakeven for GIS/SPA couple
GISFLAG	Federal GIS/SPA/ESPA flag
GISTFLAG	Provincial GIS top-up flag
SPAXO	Benefit Cross-over GIS/SPA vs GIS one pensioner couple
UIBRA	UI repayment base amount (UI and EI)
UIBRANR	EI repayment base amount for non-repeaters (EI only)

nneg Change negative numbers to zero

SUMMARY

NUMBER nneg(arg);

NUMBER arg;

The nneg function returns either zero or the value of arg, whichever is larger. In other words, nneg changes negative values to zero, leaving positive values unchanged.

SUMMARY

The Old Age Security program provides taxable monthly benefits to all Canadians age 65 and over who meet the Canadian residency requirements. Benefits are either full or partial depending on a person's history of residency in Canada. The program is not income tested. The SPSM oas function is based on the age of the individual and, for immigrants, the years since immigration as reported at the time of the SCF survey in April 1985.

The Seniors Benefit program was added to the model based on the description provided with the 1996 Federal Budget. The Seniors Benefit will replace the OAS/GIS benefits in 2001. It will be a tax-free; income tested benefit which will be determined on the basis of the incomes from both spouses. The maximum benefits will be \$120 more than the maximum OAS/GIS for 2001. These rates are fully indexed for inflation.

People aged 60 or over on December 31, 1995 will be able to choose to move to the Seniors Benefit or keep the existing OAS/GIS payments. The SPA program remains in place but is enriched by \$120.

Program Description

As amended in 1957 and 1965 the OAS program provides full benefits to persons born in Canada or those having immigrated to Canada more than 10 years before their 65th birthday with no provisions for partial benefits. In June 1977 the program was modified to provide partial benefits to immigrants having resided in Canada for between 10 to 39 years at the time of their 65th birthday. These individuals are eligible for benefits in proportion to the number of years in Canada at age 65 divided by 40. Note that years of eligibility do not increase after the year of the beneficiary's 65th birthday. Thus an immigrant of twenty years at his/her 65th birthday would be eligible for 20/40 or 50% of full OAS benefits. Persons having immigrated to Canada less than ten years prior to their 65th birthday were ineligible for OAS until 1987. In that year the OAS program was modified to allow for immigrants from certain countries having reciprocal arrangements with Canada to use years of residency in the country of emigration to count towards meeting the minimum 10 years residency requirement. However, in these cases it is only the years of residence in Canada which are used to determine the rate of partial benefits.

SPSM Implementation

The oas function determines benefits based on the age of the individual and the years since immigration as reported at the time of the SCF survey in April 1985. Because OAS provides an individually determined benefit the simulation operates at the level of a household assigning benefits to all eligible individuals. The model first adjusts years since immigration in two ways:

1. It determines the years since immigration at the time of the potential beneficiary's 65th

birthday. This is done by subtracting the difference between the individual's age and 65 years from the reported years since immigration. [immi = immi - (idage-65)]

2. It adjusts the immigration status of persons who were eligible for Full OAS under the original program specifications but would qualify for only partial benefits since 1977. This is done by setting the years since immigration to 40 for persons having 10 or more years since immigration at the time of their 65th birthday if that birthday was in 1977 or earlier. [immi =40 if(immi >=10 and TARGETYEAR- idage <= 12)]

Notice that the years since immigration for any given individual after adjustment number 1 will remain the same regardless of the year for which the simulation is being run. For example an immigrant of 38 years, age 73, would have an adjusted years since immigration of 30 years, (immi = (38-(73-65)=30). Because of adjustment 2 above that individual would receive full OAS benefits in simulations run for 1984 but would receive 75% partial benefits in simulations run for 1988. In other words, a pensioner who is 73 years old in 1984 would have been 65 years old in 1976; the year before partial benefits were introduced. However a 73 year old in 1988 would have been age 65 in 1980; after partial benefits were introduced.

The model next determines if full eligibility requirements have been met for benefits and if so the full year equivalent of maximum OAS benefits are assigned (see BOAS in the *Parameter Guide*). Next, persons ineligible for OAS are screened out. Lastly, the model assigns partial benefits to persons with an adjusted years since immigration of between 10 and 39 years.

With the new Senior Benefit program, first, the seniors benefit (senben.c) is calculated. Then ccept calls drv again, and the benefit is zeroed out and OAS/GIS is calculated instead. For persons who lost under this change, drv is called a third time with the seniors benefit package.

Interpretation

The results of the model are not directly comparable with and thus will not match administrative OAS expenditure figures. The discrepancy arises due to administrative irregularities as well as survey data deficiencies.

There are five major sources of underestimation by the oas function. The benefits of persons having received benefits during 1984, yet who had died before the date of the survey, will not be accounted for in the SPSD/M. The survey coverage excludes native Canadians on reservations as well as persons living in the Yukon and North West Territories; thus the OAS benefits of these persons are excluded from SPSM totals. Published figures include payments to persons not residing in Canada as well as retroactive lump-sum payments for late applicants. A further provision not accounted for in this algorithm is the use of years of residence in another country to meet minimum residency requirements. This will not affect the model results if run in years before 1988. The effect is small in any case.

Due to the discrepancy between reported age on the SCF and actual age in 1984 overestimation of aggregate OAS benefits for persons aged 65 and 66 arises. For example 25% of those reporting their age as 65 in March of 1985, and thus receiving full OAS

Benefits in SPSM, would actually have been born between January and March 1985 (assuming births are distributed approximately evenly by month). As such they would have actually received no OAS. Furthermore, the other 75% of the 65 year olds and 17% of 66 year olds would have actually received OAS for only part of 1984. Currently, the SPSM makes no stochastic adjustments for such cases.

Relation to Other SPSM Routines

OAS depends on the input parameters for basic OAS benefits and years since immigration. The calculation of OAS and other modeled variables occurs prior to and affects the calculation of net income and related GIS and GIS 'top-up' programs. The modeled benefits are reported in net income, elderly income, disposable income, transfer income, total income, consumable income. The oas function is called before txinet (calculation of individual net income) by drv.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BOAS	Basic OAS
OASFLAG	Old age security flag
SBFLAG	Activate calculation of Seniors Benefit
SBOPTFLG	Optimize Seniors benefit with OAS/GIS
TARGETYEAR	Year of analysis
INPUT VARIABLES:	
hdageeld	Age of eldest in household
hdseqhh	Household sequence number
hhnin	Number of individuals in household
idage	Age
idimmi	Years since immigration
imsbz	Is Seniors Benefit Zeroed?
OUTPUT VARIABLES:	
imioas	OAS benefits
imninc	No income flag
imoaspar	Partial OAS residency flag
imoasres	Partial OAS fraction

pmaddent Define and add a parameter

SUMMARY

The pmaddent function is used to define a new parameter to the SPSM parameter manipulation facilities. Please see the [Programmer's Guide](#) for more information.

randrnd Randomly round a floating point number to an integer

SUMMARY

The randrnd() function can be used to round fractional quantities to integer values in such a way that the sum of the values will remain (virtually) unchanged. Conventional rounding techniques do not have this property. For example, say that we have a set of 1000 numbers, each of which has the value 0.1. The sum of this set of numbers is 100.0. If we round each member of this set to the nearest integer, the sum of values would become 0.0. If we rounded randomly up or down, the sum would be 500. Neither of these rounding processes preserve the original sum. What we wish to do is to round 100 of the values up to 1.0 and 900 of the numbers down to 0.0. The randrnd() function simplifies this process.

The first argument to randrnd() is the value which is to be integerized, while the second is a uniformly distributed random number between 0.0 and 1.0 used to perform the rounding. The second argument is normally one of the built-in random number streams created by the SPSM Random Number Facility (see the [Users' Guide](#) for more details on this facility). The result of randrnd() is an unbiased, randomly rounded integerized value. In the following example, the variable invalid has the value 2.0 for 30% of the time and 3.0 for 70% of the time.

```
intval = randrnd(2.7, idrand0);
```

The randrnd() function can be used to simplify operations such as the production of alternate weight files. For a specific example, see the description of the bldwgt.exe utility found in the *SPSM Tools Users Manual*.

The vardef function (actually a macro) is used to define a new variable to the facilities of the SPSM that make use of variables. Please see the [Programmer's Guide](#) for more information.

round Round to nearest integer

SUMMARY

```
NUMBER round(arg);
```

NUMBER arg;

The round function converts its argument to the nearest whole number.

samod Compute social assistance or guarantees

SUMMARY

Social assistance payments are not currently calculated by the SPSM. Data requirements are too great for a detailed micro-simulation. For example, the database contains no information on the holding or recent sale of liquid or fixed assets. This function is currently used to create a variable for social assistance by manipulating social assistance payments reported by the elderly (idisa) and GIS supplementation programs and other forms of social assistance (imigist). In addition, the splitting of Social Assistance payments between the federal and provincial governments is performed here. It is also intended as a function in which algorithms for social assistance or other guarantees can be developed by glass box users.

Program Description

There are a number of federal, provincial and municipal programs which provide some form of social assistance payments to various target groups. The SPSM simulates six GIS supplementation programs (see the description of the gist function) which are classified with the other social assistance programs by the SCF. In fact the SCF records benefits received from over 30 provincial and municipal social assistance programs under one title of which six are simulated by the SPSM. This algorithm is designed to ensure no double counting of provincial GIS supplement program benefits occurs between simulated social assistance (imisa) and the provincial GIS supplement programs (imigist).

SPSM Implementation

If the function is deactivated with SAFLAG, no social assistance benefits are reported for any individual. If the function is turned on the database values of reported Social Assistance payments is used as the reported value of social assistance for all persons under the age of 65. For persons aged 65 and over there are three possible means of calculating social assistance which are controlled by the SAELDOPT parameter. These options are as follows.

- Social assistance is set to zero for all persons aged 65 and over.
- For individuals over age 64 who received simulated Provincial GIS supplementation benefits Social Assistance benefits are set to zero. If no Provincial GIS supplement is assigned to an individual over age 64, the simulated social assistance reported by the SPSM is the same as the reported value on the database.
- For all individuals over the age of 64 the value of simulated social assistance is set to the positive difference between reported and simulated social assistance.

In addition to performing the calculations for Social Assistance, samod computes the splitting of payments between the Federal and Provincial governments. This splitting corresponds to the federal/provincial cost sharing agreements in the Canada Assistance Plan.

The payment splitting is controlled by the parameter SAFS which is the federal proportional share of SA benefits. This parameter is available to be changed in black box mode and will determine the value of the variable imfsa which represents the value of the federal share. The provincial share of SA benefits is calculated as the difference between total SA benefits and the calculated federal amount and is represented by the variable impsa.

Relation to Other SPSM Routines

The samod function is called by drv after the calculation of provincial GIS supplements in gist.

CROSS REFERENCE

Function Description

INPUT PARAMETERS:

SAELDOPT	SA for elderly calculation method [1=~SA,2=GIST->~SA,3=diff]
SAFLAG	Social assistance flag
SAFS	Federal share of social assistance [prov]
SAPFLAG	Social assistance predicted value flag
SATARGET	Social assistance target for predicted SA
SFAOUT	Proportion of social assistance to eliminate

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfnpers	Number of persons in census family
hdprov	Province
hhncf	Number of census families in household
idage	Age
idisa	Social assistance income
idsapred	Predicted amount of SA received
idsarank	Predicted ranked likelihood of getting SA
imigist	GIS provincial top-up

OUTPUT VARIABLES:

imfsa	Federal social assistance
imisa	Social assistance (or replacement program)
imninc	No income flag
impsa	Provincial social assistance

SUMMARY

The Seniors Benefit program was added to the model based on the description provided with the 1996 Federal Budget. The Seniors Benefit will replace the OAS/GIS benefits in 2001. It will be a tax-free income tested benefit which will be determined on the basis of the incomes from both spouses. The maximum benefits will be \$120 more than the maximum OAS/GIS for 2001. These rates are fully indexed for inflation.

There are six family types considered by the program.

GIS/SPA Type	Family Status
1. Single Pensioner:	Unattached Individual, OAS Pensioner
2. Widowed Pensioner:	Unattached Individual, Age 60-64, Widowed
3. Married 2 Pensioner:	Married Couple, Both OAS pensioners
4. Married pensioner with SPA spouse:	Married Couple, OAS Pensioner with SPA recipient
5. Married pensioner with older spouse non-pensioner:	Married couple, 1 OAS pensioner, spouse ineligible for OAS or SPA is the older
6. Married pensioner with younger spouse non-pensioner:	Married couple, 1 OAS pensioner, spouse ineligible for OAS or SPA is the younger

The maximum benefit is reduced in two steps. The first step is analogous to GIS. The benefit is reduced at a first step rate associated with the family type, for all income over the first step threshold. The result cannot be reduced to anything smaller than *imsboas*, which is the OAS portion of the seniors benefit. The length of residency in Canada affects *imsboas*. The resulting Seniors Benefit is then reduced at the second step rate for all incomes over the second step threshold.

People aged 60 or over on December 31, 1995 will be able to choose to move to the Seniors Benefit or keep the existing OAS/GIS payments. The SPA program remains in place but is enriched by \$120.

SPSM Implementation

The SPSM derives the Seniors Benefit in the following way. First, the eligibility for the program depending on the length of residency in Canada is calculated. The total income that will be used to derive the amount of the benefit is then calculated. For married couples, the income from both spouses is included. The previous year's income is estimated as

Net Income = PYINC *	Deflator To Simulate Previous Years Income
imicapgt	Taxable Capital Gains
+ imidivt	Dividends Received
+ idiint	Investment Income
+ idimp	Employment Income
+ idisenf	Non-Farm Self Employment Income

+ idisefm	Farm Self Employment Income
+ idioinv	Other Investment Income
+ iditoth	Other Income
+ idicqp	CPP/QPP Benefits
+ idipens	Private Pension Income
+ iditogv	Other Taxable Government Transfers
+ imiuib	Unemployment Insurance Benefits
- imalexp	Other allowable Employment Expenses
- imcqppc	CPP/QPP Contributions
- imuic	Unemployment Insurance Contributions

The model then derives the Seniors Benefit for six different types of seniors.

1) Eligible single persons 65 and over

The maximum benefit (imsbmax) is derived as $SBBENS + SBPREM$, where SBBENS is the amount which a single pensioner could have received under OAS/GIS under full indexation. The benefit is then reduced in two steps. The first step is analogous to GIS. The benefit is reduced at a rate SBRR1 for all income over GISRLS (this is a small amount which prevents tiny cheques). The result cannot be reduced to anything smaller than imsboas, which is the OAS portion of the seniors benefit. The length of residency in Canada affects imsboas, but under full residency requirements it is defined as SBRL1. The resulting Seniors Benefit is then reduced at a rate SBRR2 for all income over SBRL2.

2) Widow or Widower aged 60-64

The maximum benefit (imsbmax) is derived as $SBSPA + SBRL1 + SBPREM$. The benefit is reduced for income over the reduction level SPARL, at the rate SPAOASRR for the OAS portion of the benefit and GISRRS for the GIS portion of the benefit.

3) Couple with both spouses over 65 and eligible for the Seniors Benefit

The maximum benefit (imsbmax) for each spouse is derived as $SBBENM + SBPREM$, where SBBENM is the maximum amount which single person could have received under OAS/GIS under full indexation. The benefit is then reduced in two steps. The first step is analogous to GIS. The benefit is reduced at a rate $SBRR1/2$ for all income over GISRLM (this is a small amount which prevents tiny cheques). The benefit cannot be reduced to anything smaller than imsboas, which is the OAS portion of the seniors benefit. The length of residency in Canada affects imsboas, but under full residency requirements it is defined as SBRL1. The resulting Seniors Benefit is then reduced at a rate $SBRR2/2$ for all income over SBRL2. The income used is the income of both spouses, and halving the reduction rates (SBRR1, SBRR2) means that both spouses will receive identical amounts.

4) Couple with the youngest spouse eligible for Spouse's Allowance and the oldest spouse eligible for the Seniors Benefit

The benefit for the older spouse is derived in the same manner as for couples with both spouses eligible for the Seniors Benefit (case 3). The youngest spouse's maximum benefit is defined as BOAS + BGISM + SBPREM. The spouse's benefit is reduced using the SPARL reduction level, the OAS portion of the taxback rate (SPAOASRR), and the GIS portion of the taxback rate (GISRRM).

5) Couple with the youngest spouse eligible for the Seniors Benefit but not the older spouse

The benefit is derived in the same manner as for eligible single persons over 64 (case 1).

6) Couple with the oldest spouse eligible for the Seniors Benefit but not the younger spouse

The benefit is derived in the same manner as for eligible single persons over 64 (case 1).

Relation to Other SPSM Routines

In order to optimize eligible persons benefits with the OAS/GIS programs, the seniors benefit is optimized for these seniors. First, the seniors benefit is calculated. Then ccept calls drv again, and the benefit is zeroed out and OAS/GIS is calculated instead. For persons who lost under this change, drv is called a third time with the seniors benefit package. See oas, gis, and ccept for more information on this optimization procedure.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BGISM	Basic GIS - married
BOAS	Basic OAS
GISOASFLAG	1984 GIS top-up to OAS residence shortfall flag
GISPTDFLAG	GIS income: Payroll tax deduction flag
GISRLM	Basic GIS reduction level: married pensioners
GISRLS	Basic GIS reduction level: single pensioners
GISRRM	Basic GIS reduction rate: married pensioners
GISRRS	Basic GIS reduction rate: single pensioners
PYINC	Deflator to calculate previous year income
SBENM	Seniors Benefit maximum rate for couples
SBENS	Seniors Benefit maximum rate for singles
SBFLAG	Activate calculation of Seniors Benefit
SBOPTFLG	Optimize Seniors benefit with OAS/GIS
SBPREM	Seniors Benefit premium over GIS
SBRL1	Seniors Benefit first benefit reduction plateau
SBRL2	Seniors Benefit Second reduction level

SBRR1	Seniors Benefit First reduction rate
SBRR2	Seniors Benefit Second Reduction Rate
SBSPA	Seniors Benefit maximum rate for SPA
SPAOSRR	OAS portion of SPA taxback rate
SPARL	SPA reduction point: one married/ widowed

INPUT VARIABLES:

hhnnf	Number of nuclear families in household
idage	Age
idicqp	CPP/QPP income (114)
idiemp	Wages & salaries
idiint	Interest income (121)
idioinv	Other investment income with net rental
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
iditrrsp	Taxable RRSP withdrawals
idmarst	Marital status
imalexp	Allowable employment expenses
imcqpcc	CPP/QPP contributions
imicapgt	Capital gains (taxable)
imidivt	Dividend income (taxable)
imiuib	Unemployment Insurance/Employment Insurance benefits
imoaspar	Partial OAS residency flag
imoasres	Partial OAS fraction
imsbz	Is Seniors Benefit Zeroed?
imuic	UIC contributions
nfageeld	Age of eldest in nuclear family
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imisbspa	Federal Seniors Benefit SPA
imisenb	Federal Seniors Benefit
imninc	No income flag
imoldtyp	Type of GIS/SPA nuclear family
imsbinc	Individual income reducing Seniors Benefit
imsbmax	Federal Seniors Benefit maximum benefit
imsboas	Federal Seniors Benefit OAS portion
imsbtyp	Type of Seniors Benefit entitlement
imspatyp	Type of SPA entitlement

strn Retrieve string by string number

SUMMARY

The strn function is used by the SPSM to print prompts and error messages in a language-independent way. The argument to the function identifies which string is to be retrieved.

strn retrieves the string from a language-specific database of strings into an internally-maintained buffer and returns a pointer to the retrieved string. This function is not intended to be used by the SPSM user, and is documented here for reference purposes only.

taxbk1 One level tax-back function

SUMMARY

```
NUMBER taxbk1(inc, exmpt, lvl1, rr1);

NUMBER inc;            /* income subject to tax back            */
NUMBER exmpt;         /* exemption on income for tax back         */
NUMBER *lvl1;         /* level of benefit                            */
NUMBER rr1;            /* reduction rate for tax-back               */
```

The taxbk1 function is used to reduce a benefit at a fixed rate based on income in excess of a specified exemption level. If the benefit (*lvl1) is reduced to zero, taxbk1 returns the amount of income 'unused' in the reduction process. In other words, the return value represents the income in excess of the break-even income for the benefit.

taxbk2 Two level tax-back function

SUMMARY

```
NUMBER taxbk2(inc, exmpt, lvl1, rr1, lvl2, rr2)

NUMBER inc;            /* income subject to tax back            */
NUMBER exmpt;         /* exemption on income for tax back         */
NUMBER *lvl1;         /* level (#1) of benefit                    */
NUMBER rr1;            /* reduction rate (#1) for tax-back         */
NUMBER *lvl2;         /* level (#2) of benefit                    */
NUMBER rr2;            /* reduction rate (#2) for tax-back         */
```

The taxbk2 function is used to reduce a two-tiered benefit at a fixed rates based on income in excess of a specified exemption level. The first tier benefit (*lvl1) is first reduced at rate rr1 based on income (inc) in excess of the specified threshold (exmpt). If the first tier benefit is reduced to zero, the second tier of benefit (*lvl2) is reduced at rate rr2 based on remaining income. If the second tier benefit (*lvl2) is reduced to zero, taxbk2 returns the amount of income 'unused' in the reduction process. In other words, the return value represents the income in excess of the break-even income for the benefit.

SUMMARY

Program Description

Calculation of the Alberta taxes.

When ATXFLG is off, Basic Alberta Tax (imbpt) is a proportion (APTF) of Basic Federal Tax (imbft). A tax reduction is calculated as a basic amount (ATRBC) minus a proportion (ATRF) of Basic Alberta Tax (imbpt). Alberta Tax Payable (imtxp) is calculated as Basic Alberta Tax (imbpt) minus the tax reductions.

The 2000 budget stated that Alberta would convert to a tax on taxable income starting in 2001. When the tax on taxable income flag is turned on (ATXFLG), a provincial tax table (APTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (APNTRC) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(ABXM)
impatxc	Age amount tax credit	(AAXM, AAXRR, AAXTD, AAXPI)
impmartc	Married and equivalent-to-married tax credit	(AMXM, AMXMT, AEMXM, AEMXMT)
impcgtc	Caregiver tax credit	(ACGTC, ACGTCFLG, ACGTCTC, ACGTCTD, ACGTCTK)
impchrctc	Charitable donations	(ACHATL1, ACHATR1, ACHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(AMAXDX)
impdtxc	Dividend tax credit	(ADTCR)
impdtxc	Education tax credit	(AEDXPM, AMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(AYPNDL)
imptutxc	Tuition Tax credit	(AMAXET)
impuictc	EI contributions tax credit	

The option to apply a minimum tax is controlled using AAMTOPT.

Calculation of the Alberta Family Employment Tax Credit.

When the parameter AFETCFLAG is set to 1, the value of imiafetc variable is calculated as a percentage (AFETCBR) of nuclear family employment income above a threshold (AFETCCI) to a maximum dollar level which is calculated as AFETCBPC times the number of eligible children (nfnkids) up to a maximum number of children of AFETCNC. The maximum benefit is reduced by a percentage (AFETCRR) of nuclear family net income in excess of the threshold AFETCTD.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
AAMTOPT	Alta alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
AAMTPCTF	Alta amt rate as pct of additional fed tax due to minimum tax
AAMTTX	Alta amt rate as tax on adjusted income
AAXM	Alta Age Amount
AAXPI	Alta Age Amount phase in rate for 1994 and beyond
AAXRR	Alta Age Amount credit reduction rate
AAXTD	Alta Age Amount net income turndown
ABXM	Alta Basic Personal Exemption/amount
ACGTC	Alta Caregiver Tax Credit
ACGTCFLG	Alta Caregiver Tax Credit activation flag
ACGTCTC	Alta Caregiver tax credit take-up rate by age of elderly [age,rate]
ACGTCTD	Alta Caregiver Tax Credit Turn Down Income
ACGTCTK	Alta Caregiver tax credit take-up rate by income level [employment income,rate]
ACHATL1	Alta Charitable Donations amount level 1
ACHATR1	Alta Charitable Donations tax credit rate 1
ACHATR2	Alta Charitable Donations tax credit rate 2
ADTCR	Alta dividend tax credit rate
AEDXPM	Alta Education Amount per month
AEMXM	Alta equivalent to married amount
AEMXMT	Alta equivalent to married turndown level
AFETCBPC	Alberta Family Employment Tax Credit Benefit Per Child
AFETCBR	Alberta Family Employment Tax Credit Benefit Rate
AFETCCI	Alberta Family Employment Tax Credit Benefit Cut-in Level
AFETCFLAG	Alberta Family Employment Tax Credit Activation Flag
AFETCNC	Alberta Family Employment Tax Credit Maximum Number of Children
AFETCRR	Alberta Family Employment Tax Credit Reduction Rate
AFETCTD	Alberta Family Employment Tax Credit Turndown Level
AFTAX	Alberta flat surtax rate on taxable income
AMAXDX	Alta Maximum Disability deduction/amount
AMAXET	Alta maximum on transfer of education and tuition amount
AMXM	Alta married amount
AMXMT	Alta married amount turndown level
APNTPCR	Alta provincial non-refundable tax credit rate

APTC	Alberta political contribution table [total donations, donation allowed]
APTCBEN	Maximum Alberta political tax credit allowed
APTF	Alberta provincial tax fraction
APTX	Alta tax table [taxable income, basic provincial tax]
ASCI	Alberta surtax cut-in
ASF	Alberta surtax fraction
ATRBC	Alberta tax reduction basic claim
ATRF	Alberta tax reduction fraction
ATXFLG	Alta tax on taxable income activation flag
AYPNDL	Alta Pension Income Deduction Amount

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idrand	Random numbers [array]
idsex	Sex
idtuitn	Tuition fees (320)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts (calculated)
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imddefn	All deductions from net income
imdepni	Dependant's net income
imidivt	Dividend income (taxable)
iminet	Net income
imisa	Social assistance (or replacement program)
imitax	Taxable income
immeda	Medical expenses allowed (computed)

imuic	UIC contributions
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imiafetc	Alberta Family Employment Tax Credit Benefits
imninc	No income flag
imnptc	Non-refundable provincial tax credits
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgtc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrct	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transfered from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
impnit	Provincial net income tax
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
imprvtax	Prov gross provincial tax
impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptr	Provincial tax reduction
impttxct	Prov total tax credits transfered
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

txbc Compute provincial taxes for British Columbia

SUMMARY

When CTXFLG is turned off, the Basic British Columbia Tax (imbpt) is a proportion (CPTF) of Basic Federal Tax (imbft). British Columbia Tax Payable (imtxp) is the Basic Tax plus the BC Surtax plus the BC Health Care Maintenance Surtax.

The BC Surtax is a proportion (CSF) of Basic BC Tax (imbpt) exceeding the surtax level (CSCI). The BC Health Care Maintenance Surtax is a proportion (CHCM) of BC Tax after the surtax has been added.

For some years, the amount of BC Tax payable may be reduced by setting BC Tax Payable

(imtxp) to Federal Tax Payable (imtxf) if Net Income (iminet) is below a specified limit (CPTC). This option is eliminated by setting CPTC to zero.

The 2000 budget announced that British Columbia would convert to a tax on taxable income starting in 2000. When the tax on taxable income flag is turned on (CTXFLG), a provincial tax table (CPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (CPNTRC) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(CBXM)
impatxc	Age amount tax credit	(CAXM, CAXRR, CAXTD, CAXPI)
impmartc	Married and equivalent-to-married tax credit	(CMXM, CMXMT, CEMXM, CEMXMT)
impcgtc	Caregiver tax credit	(CCGTC, CCGTCFLG, CCGTCTC, CCGTCTD, CCGTCTK)
impchrtc	Charitable donations	(CCHATL1, CCHATR1, CCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(CMAXDX)
impdtxc	Dividend tax credit	(CDTCR)
impedtxc	Education tax credit	(CEDXPM, CMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(CYPNDL)
imptutxc	Tuition Tax credit	(CMAXET)
impuictc	EI contributions tax credit	

The option to apply a minimum tax is controlled using CAMTOPT.

The British Columbia labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The BC provincial credit is modelled as CLVCRT times the gross amount up to CLVCMAX. The credit cannot be more than provincial taxes (imtxp).

B.C. Family Bonus

Total benefits received under the British Columbia Family Bonus program commencing in July 1996.

When the parameter BCFBFLAG is set to one the value of this variable is calculated as BCFBBAS times the number of children in the nuclear family (nfnkids) reduced by a

proportion of head plus spouse net income (iminet + imisa) above the turndown of BCFBTD. This proportion for families with one child is BCFBRRS and for multiple child families is BCFBRR. The value calculated in this manner is multiplied times the parameter BCFBPI.

B.C. Family Bonus benefits (imibcfb) are assigned to the mother if present, or if not to the head of the nuclear family.

The calculation of the B.C. Family Bonus was changed to include the level of the National Child Supplement beginning in 1998. The flag BCFBIFS was added to turn on or off the inclusion of the National Child Supplement in the calculation of the B.C. Family Bonus.

The British Columbia Earned Income Benefit which was also introduced in 1998, was added to the code. When BCEIBFLG is assigned a value of 1, the calculation of the British Columbia Earned Income Benefit is activated, depending on the presence of children in the family. For families with lower incomes, the benefit starts to be phased in at BCEIBPI, and reaches its maximum at incomes of BCBEMX. The slope of the phase in is therefore calculated as the maximum working income supplement a family can receive divided by (BCBEMX – BCEIBPI).

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BCBEIS1	B.C. Earned Income Benefit for first child
BCBEIS2	B.C. Earned Income Benefit for second child
BCBEIS3	B.C. Earned Income Benefit for each additional child
BCBEITD	B.C. Earned Income Benefit Turndown
BCBEMX	B.C. Earned Income Benefit Income Reduction
BCBERR1	B.C. EIB reduction rate for families with 1 child
BCBERR2	B.C. EIB reduction rate for families with 2 children
BCBERR3	B.C. EIB reduction rate for families with 3+ children
BCEIBFLG	Activate B.C. Earned Income Benefit Program
BCEIBPI	B.C. Earned Income Benefit Income Phase In
BCFBBAS	B.C. Family Bonus amount per child
BCFBFLAG	Activate B.C. Family Bonus Program
BCFBIFS	Activate B.C. Family Bonus to include Federal NCS
BCFBNCS1	B.C. Family Bonus National Child Supplement for first child
BCFBNCS2	B.C. Family Bonus National Child Supplement for second child
BCFBNCS3	B.C. Family Bonus National Child Supplement for each additional child
BCFBNCSRR1	B.C. Family Bonus NCS reduction rate for families with 1 child
BCFBNCSRR2	B.C. Family Bonus NCS reduction rate for families with 2 children

BCFBNCSTR3	B.C. Family Bonus NCS reduction rate for families with 3+ children
BCFBNCSTD	B.C. Family Bonus National Child Supplement Turndown
BCFBPI	B.C. Family Bonus phase-in
BCFBRR	B.C. Family Bonus multiple child reduction rate
BCFBRRS	B.C. Family Bonus single child reduction rate
BCFBTD	B.C. Family Bonus Turndown
CAMTOPT	B.C. alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
CAMTPCTF	B.C. amt rate as pct of additional fed tax due to minimum tax
CAMTTX	B.C. amt rate as tax on adjusted income
CAXM	B.C. Age Amount
CAXPI	B.C. Age Amount phase in rate for 1994 and beyond
CAXRR	B.C. Age Amount credit reduction rate
CAXTD	B.C. Age Amount net income turndown
CBXM	B.C. Basic Personal Exemption/amount
CCGTC	B.C. Caregiver Tax Credit
CCGTCFLG	B.C. Caregiver Tax Credit activation flag
CCGTCTC	B.C. Caregiver tax credit take-up rate by age of elderly [age,rate]
CCGTCTD	B.C. Caregiver Tax Credit Turn Down Income
CCGTCTK	B.C. Caregiver tax credit take-up rate by income level [employment income,rate]
CCHATL1	B.C. Charitable Donations amount level 1
CCHATR1	B.C. Charitable Donations tax credit rate 1
CCHATR2	B.C. Charitable Donations tax credit rate 2
CDTCR	B.C. dividend tax credit rate
CEDXPM	B.C. Education Amount per month
CEMXM	B.C. equivalent to married amount
CEMXMT	B.C. equivalent to married turndown level
CHCM	British Columbia provincial health care surtax
CLVCMAX	Maximum B.C. labour-sponsored funds tax credit allowed
CLVCRT	Percent of B.C. labour-sponsored funds cost allowed as credit
CMAXDX	B.C. Maximum Disability deduction/amount
CMAXET	B.C. maximum on transfer of education and tuition amount
CMXM	B.C. married amount
CMXMT	B.C. married amount turndown level
CPNTCR	B.C. provincial non-refundable tax credit rate
CPTC	British Columbia provincial tax reduction cut-in
CPTCBEN	Maximum B.C. political tax credit allowed
CPTCT	B.C. political contribution table [total donations,donation allowed]
CPTF	British Columbia provincial tax fraction
CPTX	B.C. tax table [taxable income,basic provincial tax]
CRFLAG	British Columbia rental reduction flag
CRTRB	British Columbia renter tax reduction basic credit
CRTRD	British Columbia renter tax reduction credit for other dependants
CRTRP	British Columbia renter tax reduction proportion of rent allowed
CRTRPN	British Columbia renter tax reduction proportion of net income
CRTRS	British Columbia renter tax reduction credit for spouse
CRTRT	B.C. renter tax reduction base amount turndown [dependants, amount]

CSCI	British Columbia surtax first cut-in level
CSCI2	British Columbia surtax second cut-in level
CSDC	British Columbia provincial surtax dependant credit
CSF	British Columbia surtax first level rate
CSF2	British Columbia surtax second level rate
CSTC	British Columbia stc amount
CSTCFLAG	British Columbia sales tax credit flag
CSTCR	British Columbia stc reduction rate
CSTHINC	British Columbia family head income threshold (stc)
CSTKINC	British Columbia kid income threshold top-up (stc)
CSTSINC	British Columbia spousal income threshold top-up (stc)
CTCINC	CTC family income scaling factor
CTXFLG	B.C. tax on taxable income activation flag
CVCFLAG	British Columbia venture capital tax credit flag
CVCMAX	British Columbia maximum annual venture capital tax credit
CYPNDL	B.C. Pension Income Deduction Amount
PYINC	Deflator to calculate previous year income

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfnkids	Number of children in census family
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcf	Person's census family [pointer]
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idlabtxg	Gross Labour funds bought (413)
idnf	Person's nuclear family [pointer]
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)
idrand	Random numbers [array]
idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
idvencap	Venture capital tax credit (564)
imamtdf	Difference due to minimum tax

imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts (calculated)
imchclm	Number of dependent children claimed
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepni	Dependant's net income
imfcbene	Total Federal Child Benefits Earning suppl
imidivt	Dividend income (taxable)
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
immarex	Married exemption claimed
immartxc	Married tax credit claimed
immeda	Medical expenses allowed (computed)
imrentpd	Imputed rent paid
imtxf	Federal income tax payable
imuic	UIC contributions
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imibceib	B.C. Earned Income Benefit
imibcfb	B.C. Family Bonus
imninc	No income flag
imnptc	Non-refundable provincial tax credits
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgtc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transfered from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
imprvtax	Prov gross provincial tax
impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
impptxct	Prov total tax credits transfered
imptutxc	Prov Tuition tax credit

impuictc Prov UI/EI contributions tax credit
imtxp Provincial income tax payable

txcalc Calculate federal income tax

SUMMARY

This function incorporates algorithms for the following tax measures to complete the calculation of federal taxes payable:

- Federal Dividend Tax Credit
- Federal Labour Sponsored Venture Capital Tax credit
- Basic Federal Tax (including tax credits transfers from dependants or spouse)
- Federal Tax Reduction (including transfer to spouse)
- Federal Surtax
- Federal Taxes Payable
- Alternate Minimum Tax
- Quebec Tax Abatement
- Federal refundable medical expense supplement
- Caregiver Tax Credit

Federal Dividend Tax Credit

If the filer declared dividends from taxable Canadian corporations, he or she is eligible to claim the Dividend Tax Credit which amounts to a fixed proportion of taxable dividends. This credit is non-refundable, i.e., it may be used to reduce Basic Federal Tax, but an unused portion is not refunded.

SPSM Implementation

The Federal Dividend Tax Credit (imfdtxc) is calculated as a proportion (FDTCR) of Net Taxable Dividends (imidivt). The amount is added to Total Non-transferable Tax Credits (imtaxcr) which is applied to reduce Basic Federal Tax (imbft).

Federal Dividend Tax Credit

The Labour-sponsored venture capital funds tax credit is modeled from the imputed gross amount purchased (idlabtvg). The credit (imlbtvc) is equal to FLVCRT times the gross amount (idlabtvg) up to a maximum (FLVCMAX). The rate is provincially based.

Basic Federal Tax

Basic Federal Tax is defined as Federal Tax Payable on Taxable Income minus certain tax credits. Before 1988, only the Federal Dividend Tax Credit and Scientific Research Tax Credit were subtracted in the calculation of Basic Federal Tax. If deductions are converted to

tax credits, as proposed in the June 1987 White Paper on Tax Reform, then these tax credits are subtracted as well.

SPSM Implementation

Basic Federal Tax (imbft) is calculated the same way whether or not the tax credits proposed by the White Paper are applied. First, Federal Tax Payable on Taxable Income (imfedtax) is calculated using the interpolating lookup function lkup1 to determine taxes payable on Taxable Income (imitax) from the table FTX.

Dependants are treated separately from the head and spouse since the rules applying to the transfer of deductions from dependant to parent differ from those applying to the transfer of deductions from the spouse.

Transfers from Dependant to Parent

In calculating the dependant's Basic Federal Tax, the following nontransferable credits are subtracted from imbft:

- Basic Personal Tax Credit (imbtc)
- Age Tax Credit (imatxc)
- Charitable Donations Tax Credit (imchartc)
- CPP/QPP Contributions Tax Credit (imcppctc)
- Federal Dividend Tax Credit (imfdtxc)
- Medical Expense Tax Credit (immedatc)
- Pension Income Tax Credit (impentxc)
- UI Contributions Tax Credit (imuictc)

If any of these tax credits has not been calculated, for example, in a pre-reform scenario, most of these credits will have been set to zero.

A dependant may transfer an unused portion of certain tax credits to a supporting parent. Since a limit may be imposed on the amount of the combined Education Tax Credit and Tuition Tax Credit, these are treated separately from the Disability Tax Credit.

If a dependant requires all transferable tax credits to further reduce Basic Federal Tax, i.e., Basic Federal Tax (imbft) exceeds Total Transferable Tax Credits, then the tax credits are subtracted from imbft and no transfer occurs.

If the dependant's Total Transferable Tax Credits (txcrt) exceeds Basic Federal Tax, imbft is reduced to zero and the amount potentially transferable to a supporting parent is calculated as the amount of Disability Tax Credit (imdisatc) not required to reduce Basic Federal Tax plus the lesser of:

- a) the combined Education and Tuition amount not required to reduce Basic Federal Tax to zero, and
- b) the maximum transferable of the combined Education and Tuition amount (MAXET)

The actual amount transferred (imttxcrt) is calculated by reducing the amount potentially transferred (ttxcrt) by a proportion (FNTCR) of Net Income (iminet) exceeding the Tax Credit Transfer Reduction Level (BXM).

The total amount of tax credits transferable from all dependants is accumulated in the variable ctxcrt which is subsequently used to reduce Basic Federal Tax for the parent with the higher Net Income (iminet).

These algorithms do not allow the partitioning of the dependant's tax credits between both supporting parents and, therefore, in some cases, the total taxes paid by the family may not be minimized.

Transfers From Spouse

In calculating the Basic Federal Tax of the head and spouse, the following non-transferable credits are subtracted from imbft:

- Basic Personal Tax Credit (imbtc)
- Charitable Donations Tax Credit (imchartc)
- CPP/QPP Contributions Tax Credit (imcppctc)
- Tax Credit for Dependant Children (imctxcs)
- Federal Dividend Tax Credit (imfdtxc)
- Married Tax Credit (immartxc)
- Medical Expense Tax Credit (immedatc)
- UI Contributions Tax Credit (imuictc)

If any of these tax credits have not been calculated, for example, in a post-reform scenario, most of these tax credits will have been set to zero.

An unused portion of certain transferable tax credits may be transferred from the spouse. The transferable tax credits are:

- Age Tax Credit (imatxc)
- Disability Tax Credit (imdisatc)
- Pension Income Tax Credit (impentxc)
- Education Tax Credit (imedtxc)
- Tuition Tax Credit (imtutxc)

Since a limit may be imposed on the amount of the combined Education and Tuition Tax Credits, these are treated separately from the others.

If the filer requires all Transferable Tax Credits (txcrt) to reduce Basic Federal Tax (i.e., imbft exceeds txcrt) then the tax credits are subtracted from Basic Federal Tax and no transfer occurs.

If the filer's Transferable Tax Credits (txcrt) exceed Basic Federal Tax, then imbft is reduced to zero and the remainder of the Potentially Transferable Tax Credits (ttxcrt) is calculated as the sum of:

- Disability Tax Credit (imdisatc)
- Age Tax Credit (imatxc)
- Pension Income Tax Credit (impentxc)

which is not required to reduce Basic Federal Tax to zero plus the lesser of:

- a) the combined Education and Tuition amount not required to reduce Basic Federal Tax to zero, and
- b) the maximum transferable of the combined Education and Tuition amount (MAXET)

The actual amount transferred (imttxcrt) is calculated by reducing the amount potentially transferred (ttxcrt) by a proportion (FNTCR) of Net Income (iminet) exceeding the Tax Credit Transfer Reduction Level (BXM).

Although this value is calculated for both head and spouse, the one with the higher Net Income (iminet) actually receives the transfer. The amount transferred from the spouse is stored in the variable imstxcrt. The amount transferred from all dependants is stored in imctxcrt.

Federal Tax Reduction

Before 1986, all filers were eligible for a Federal Tax Reduction. Before 1984, this amounted to a fixed tax credit independent of taxes payable. In 1984 and 1985, the reduction itself was reduced by a proportion of Basic Federal Tax exceeding a certain limit. The unused portion of the tax reduction was transferable to the filer's spouse.

SPSM Implementation

The Federal Tax Reduction Available (imftr) is calculated for each filer as a fixed amount (MXFTR) reduced by a proportion (FTRRR) of Basic Federal Tax (imbft) exceeding the Reduction Level (FTRRL).

If the head or spouse do not require the entire Federal Tax Reduction Available to reduce Basic Federal Tax to zero, then the remainder (hfrt for head, sfrt for spouse) is added together into imftrt and then summed with the other spouse's Federal Tax Reduction (imftr).

The Federal Tax Reduction (imftr) is then subtracted from Basic Federal Tax imbft to compute Federal Tax (imftax).

Federal Surtax

In 1985 a Federal Surtax was introduced as an additional tax based on Basic Federal Tax payable. In 1985, the surtax was calculated as a proportion (2.5%) of Basic Federal Tax exceeding \$6,000 plus 2.5% of Basic Federal Tax exceeding \$15,000. In 1986, this was extended to 1.5% of all Basic Federal Tax plus 5% of Basic Federal Tax exceeding \$6,000 plus 5% of Basic Federal Tax exceeding \$15,000. In 1987 this was simplified to a flat rate (3%) on all Basic Federal Tax.

SPSM Implementation

The model allows for three surtax levels and three surtax rates. The total Federal Surtax (imfsur) is calculated as:

- a proportion (FSURR1) of Basic Federal Tax exceeding Surtax Level 1 (FSURL1), plus
- a proportion (FSURR2) of Basic Federal Tax exceeding Surtax Level 2 (FSURL2), plus
- a proportion (FSURR3) of Basic Federal Tax exceeding Surtax Level 3 (FSURL3), minus
- the amount of the additional Federal Foreign Tax Credit from 1986 forward (represented by variable (idfdsft)).

The result is then added to Federal Taxes (imftax) (minus certain federal tax credits) to derive Federal Taxes Payable (imtxf).

Federal Surtax Reduction

The Federal Surtax reduction (imfsurtr) announced in the 1998 federal budget is calculated. The maximum value that the reduction may reach is FSURTRMX. The reduction is reduced by a proportion (FSURTRRR) of basic federal tax (imbft) which exceeds a certain level (FSURTRRL). This reduction is then subtracted from the federal surtax (imfsur).

Federal Taxes Payable

Federal Taxes Payable (imtxf) is defined as Federal Tax (imftax) plus the Federal Surtax (see above) minus the following tax credits:

- Federal Other Tax Credits
- Federal Political Contribution Tax Credit (imfptc), and

Alternate Minimum Tax

In 1986, a minimum tax on individuals was introduced with the intention of increasing the tax liability of those high income individuals who use the tax incentives provided by the current law to structure their affairs so as to pay little or no tax.

The Alternative Minimum Tax requires the calculation of an adjusted taxable income disallowing certain deductions, a list of which follows, which are added back to taxable income.

- Pension Income Deduction
- Interest and Dividend Income Deduction
- Disability Deduction Transferred from Dependant
- Education Deduction Transferred from Dependant
- Deductions Transferred from Spouse
- Employee Home Relocation Loan Deduction
- Stock Option and Shares Deduction
- Contribution to Deferred Income Plans (RPP and RRSP contributions)
- non-taxable portion of capital gains
- capital cost allowance on MURBS and Canadian Films

The grossed-up portion of taxable dividends and Allowable Business Investment Loss are

subtracted from taxable income.

The minimum tax is then calculated as a proportion of this adjusted taxable income exceeding the exemption level.

No details are available at the time of this writing on the implementation of the minimum tax after deductions which are converted to tax credits as proposed in the June 1987 White Paper on Tax Reform.

SPSM Implementation

If the Minimum Tax Rate (AMTTX) is not set to zero, the minimum tax algorithms are executed.

The first step recalculates an adjusted taxable income for minimum tax purposes (naitax) by adding the following items to imitax:

- RPP Contributions (idrpp)
- RRSP Contributions (idrrsp)
- Other Deductions from Total Income (idothdn, representing Capital Cost Allowances)
- Pension Income Deduction (imintdn)
- Interest Income Deduction (imintdn)
- Deductions Transferred from Spouse (imdedt)
- the non-taxable portion of Capital Gains (idicapg * (1 - CAPGIR))

The grossed-up portion of dividends (idiv (FDGUR - 1)), Business Investment Losses (idnclos), and the Minimum Tax Exemption (AMTEX) are subtracted from this value.

The Basic Minimum Tax (ambft) is calculated as a proportion (AMTTX) of Adjusted Taxable Income (naitax).

The second step in this process adjusts the Basic Minimum Tax (ambft) to account for the conversion of allowable deductions into tax credits. This requires subtracting the following tax credits from Basic Minimum Tax:

- Basic Tax Credit (imbtc)
- Spouse Tax Credit (immartxc)
- Age Tax Credit (imatxc)
- Tax Credit for Dependant Children (imctxcs)
- Education Tax Credit (imedtxc)
- Tuition Tax Credit (imtutxc)
- Medical Expense Tax Credit (immedatc)
- Charitable Donations Tax Credit (imchartc)
- Disability Tax Credit (imdisatc)
- Child Care Expense Tax Credit (imccetxc)
- CPP/QPP Contribution Tax Credit (imcppctc)
- UI Contribution Tax Credit (imuictc)

If the value of the Basic Minimum Tax (ambft) exceeds Basic Federal Tax (imbft), Federal Tax Payable (imtxf) is recalculated as Basic Minimum Tax (ambft) plus any federal surtaxes on ambft. The federal surtax is calculated in the same manner as on Basic Federal Tax, previously described.

The database does not contain sufficient detail to accurately represent some of the deductions specified in the regulations concerning the calculation of the Minimum Tax. The Disability Deduction and Education Deduction transferred from dependants are not differentiable from those deductions claimed on behalf of the filer. The Employee Home Relocation Loan Deduction and Stock Option Shares Deduction are not represented on the database. The variable idothdn (Other Deduction's from Total Income) includes Capital Cost Allowances on MURBS and Canadian Films but it also contains amounts for moving expenses and alimony payments. It is difficult to estimate the impact of these inaccuracies except to say that they are likely small compared to the large amounts of income and other deductions for the high income persons for whom the Minimum Tax is intended.

Quebec Tax Abatement

The Quebec Tax Abatement is a refundable credit on federal taxes provided to Quebec residents in lieu of direct cost-sharing by the federal government under the federal-provincial fiscal arrangements. It reduces the federal income tax payable by Quebec residents and may provide a refund. The abatement amounts to 16.5% of Basic Federal Tax.

SPSM Implementation

If the filer resides in Quebec, the full Quebec Tax Abatement (qta) is calculated as a proportion (QTAP) of Basic Federal Tax (imbft). This is divided into two portions for accounting purposes:

- imqtaa is the Quebec Tax Abatement Applied to reduce federal taxes
- imqtar is the Quebec Tax Abatement Refunded

If the Quebec Tax abatement exceeds the Federal Tax payable then a refund is made for the balance of the abatement (imqtar) and the amount of Federal tax payable is reduced by the amount of the abatement. Users may wish to note that this abatement refund was an interesting side effect of the Federal Tax reduction in effect prior to 1986 (see notes in this section).

Federal Refundable Medical Expense Supplement

SPSM Implementation

The refundable medical expense supplement (immedref) was added to imfortc. The program is only available to persons aged 18 and over who have earnings over MEDREMIN and who had allowable medical expenses (immeda). The maximum supplement is calculated as the minimum of MEDRRATE times the allowable medical expenses and MEDRMAX. The benefit is reduced by MEDRRR times the family income over the turndown which is the sum of the basic exemption (BXM), the married exemption (MXM) and the maximum disability amount (MAXDX).

Caregiver Tax Credit

The calculation of the Caregiver Tax Credit (imcgtc) is activated by the flag CGTCFLG. The credit reduces federal taxes and started in 1998. The base level of the credit is CGTC. A take-up rate CGTCTC based on age of the potential parent assigns individuals with idefrh =3 as a parent according to SCF 1994 data. Users have access to a take-up rate CGTCTK based on employment income to select the appropriate number of beneficiaries.

The benefit, imcgtc, is reduced for each dollar of net income, iminet, in excess of CGTCTD.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
AMTEX	Alternate minimum tax: exemption level
AMTRPFLG	RRSP/RPP included in Alternate minimum tax (1=included)
AMTTX	Alternate minimum tax rate
BXM	Basic personal exemption/amount
CAPGIR	Capital gains inclusion rate
CGTC	Caregiver Tax Credit
CGTCFLG	Caregiver Tax Credit activation flag
CGTCTC	Caregiver tax credit take-up rate by age of elderly [age,rate]
CGTCTD	Caregiver Tax Credit Turn Down Income
CGTCTK	Caregiver tax credit take-up rate by income level [employment income,rate]
EMPLOFLAG	Database variable(emplo) activation flag
FDGUR	Federal dividend gross-up rate
FDSFTFLAG	Database variable(fdsft) activation flag
FDTCR	Federal dividend tax credit rate
FLVCMAX	Maximum labour-sponsored funds tax credit allowed
FLVCRT	Percent of labour-sponsored funds cost allowed as credit [prov]
FNTCR	Federal non-refundable tax credit rate
FPTC	Federal political contribution table [total donations,donation allowed]
FPTCBEN	Maximum federal political tax credit allowed
FSURL1	Federal surtax level 1
FSURL2	Federal surtax level 2
FSURL3	Federal surtax level 3
FSURR1	Federal surtax rate 1
FSURR2	Federal surtax rate 2
FSURR3	Federal surtax rate 3
FSURTRMX	Maximum federal surtax reduction
FSURTRRL	Federal surtax reduction reduction level
FSURTRRR	Federal surtax reduction reduction rate
FTRRL	Federal tax reduction reduction level
FTRRR	Federal tax reduction reduction rate
FTX	Federal tax table [taxable income,basic federal tax]

GSTREBFLAG	Database variable(gstreb) activation flag
MAXDX	Maximum disability deduction/amount
MAXET	Maximum on transfer of education and tuition amount
MEDREMIN	Minimum earnings for refundable medical expense supplement
MEDRMAX	Maximum expenses allowed for medical expense supplement
MEDRRATE	Proportion of expenses allowed for medical expense supplement
MEDRRR	Reduction rate for the medical expense supplement
MINCARFLAG	Database variable(mincar) activation flag
MXFTR	Maximum federal tax reduction
MXM	Married exemption/amount
PARTLOFLAG	Database variable(partlo) activation flag
QTAP	Quebec tax abatement proportion of basic federal tax

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hdprov	Province
hhncf	Number of census families in household
hhnef	Number of economic families in household
idage	Age
idalexp	Other allowable employment expenses (229)
idcfrh	Relationship to census family head
idclos	Allowable other years capital loss (253)
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddues	Union and professional dues (212)
idefrh	Relationship to economic family head
idemplo	Employee home relocation loan dedn (248)
idexplor	Exploration and development expenses (224)
idfdsft	Foreign tax credit applied to surtax (511)
idforinc	Net foreign income (508)
idfortx	Foreign tax paid (507)
idgstreb	GST rebate (457)
idicapg	Capital gains (actual)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditc	Federal investment tax credits (412)
idlabtxg	Gross Labour funds bought (413)
idmincar	Minimum tax carryover (504)
idnclos	Allowable other years non-capital loss (252)
idothded	Other deductions from total income (232)
idpartlo	Limited partnership losses (251)
idpolcon	Federal political contributions (409)
idrand	Random numbers [array]
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idspoflg	Person has spouse
imatxc	Age tax credit

imbtc	Basic personal tax credit
imbtcsc	Basic personal tax credit supplement
imcagpex	Modelled capital gains deduction (254)
imchartc	Charitable donations tax credit
imcppctc	CPP contributions tax credit
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imctxcs	Dependent children tax credits
imdedfn	All deductions from net income
imdedt	Deductions transferred from spouse
imdepni	Dependant's net income
imdisatc	Disability tax credit
imedtxc	Education allowance tax credit
imidivt	Dividend income (taxable)
iminet	Net income
imintdn	Interest income deduction allowed
imitax	Taxable income
immartxc	Married tax credit claimed
immeda	Medical expenses allowed (computed)
immedatc	Medical expenses allowed tax credit
imothpe	Other dependant tax credit (306)
impendn	Pension income deduction allowed
impentxc	Pension income tax credit
imstkded	Modelled Stock option deduction (249)
imtutxc	Tuition tax credit
imuic	UIC contributions
imuictc	UIC contributions tax credit

OUTPUT VARIABLES:

imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imatxcrt	Total tax credits applied
imbft	Basic federal tax
imcgtc	Caregiver Tax Credit Level
imcgtcp	Dependant caregiver tax credit amount
imctxcrt	Tax credits transferred from children
imedrcv	Education and tuition transferred from others
imedtrf	Education and tuition transferred to others
imfdtxc	Federal dividend tax credit
imfedtax	Federal tax before tax credits
imfortc	Federal other refundable tax credits
imfortxc	Federal foreign tax credit (509)
imfptc	Federal Political Contribution Tax Credit
imfsur	Federal surtax
imfsurtr	Federal surtax reduction
imftr	Federal tax reduction
imftrt	Federal tax reduction transferred from spouse
imlabtxc	Federal labour-sponsored funds tax credit
immedref	Refundable medical expense supplement (452)
imoftca	Other federal tax credits applied (416)
imqtaa	Quebec tax abatement (applied)
imqtar	Quebec tax abatement (refundable)
imstxcrt	Tax credits transferred from spouse
imtaxcr	Total tax credits
imttxcrt	Total tax credits transferred
imtxf	Federal income tax payable

SUMMARY

The txccea function calculates the value of the child care expense deduction.

Description of tax measure

Child care expenses are amounts paid for child care services to allow the parent or "supporting person" to:

- a) earn income from employment or self-employment, (this does not include a period of unemployment) or
- b) take an occupational training course for which the person received an adult training allowance, or
- c) carry on research or similar work for which the person received a grant.
- d) go to school full-time

A filer is eligible to claim child care expenses if:

- a) there is no other supporting person
- b) there is a supporting person with a higher net income (excluding child care expenses) than the filer
- c) there is a supporting person with a net income lower than the filer but
 - i. the filer and supporting person were separated for at least 3 months, or
 - ii. the supporting person was in full-time attendance at a designated educational institution, or
 - iii. the supporting person was infirm or in prison for at least 2 weeks.

A combination of limitations is applied to the amount claimable:

1. Two-thirds of earned income, and
2. a fixed amount per eligible child up to a fixed maximum is applied if the net income of the filer is less than that of a supporting person (conditions (a) and (b) above).

Under condition (c) above, i.e., the income of the supporting person is lower than that of the filer, the following additional limitation applies:

3. fixed weekly amount per child up to a maximum, multiplied by the number of weeks of separation, attendance at an educational institution, infirmity or imprisonment.

In 1982, the Child Care Expense Deduction was always taken by the mother of the child if she was present. Since then, the deduction or tax credit is normally allocated to the spouse with the lower net income, exclusive of the child care expense deduction, unless that person is separated, in school, infirm or in prison.

SPSM Implementation

The amount of Child Care Expenses Allowed is derived from income tax records during the database creation process (see the *Database Creation Guide*). This value represents the amount allowed according to 1984 regulations. Though this amount may be grown or diminished by a fixed factor (GFC CET), the rules described above cannot be easily altered in the current version of SPSM.

The parameter CCEROPT determines which spouse in a two-parent family claims the Child Care Expense Deduction. If CCEROPT is given a value of 1, the deduction is always taken by the mother. With a value of 2, the deduction is taken by the parent with the lower Net Income (iminet).

The condition for a temporarily absent, lower income spouse (condition c. above) is not checked.

On the database, only one spouse of a two-parent family will have been attributed a value for Child Care Expense Deduction Allowed. The assignment of this value is done before we have complete information about the relative net incomes and may therefore be given to an inappropriate person. The model uses the current value of Net Income (iminet) to re-allocate the deduction if necessary.

The parameter CCEOPT determines if child care expenses are treated as a deduction (CCEOPT =1) or as a tax credit (CCEOPT =2).

If child care expenses are treated as a deduction (CCEOPT =1), the amount is deducted from Net Income (iminet) and added to Total Deductions from Total Income (imdedft) for the appropriate spouse.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
CCEAEMPF	CCEA fraction of employment income (Limit `B')
CCEALIM	CCEA overall limit
CCEAOAGE	CCEA Maximum eligible age for oldest child
CCEAOLD	CCEA old child limit
CCEATFLG	CCEA eligible->claimable transformation activation flag
CCEATFR	CCEA eligible->claimable fraction
CCEATLL	CCEA eligible->claimable lower limit
CCEAYNG	CCEA young child limit
CCEROPT	Child care expense deduction recipient [1=mother,2=lower income]
CCESFLAG	CCE full-time student flag

CCESOLD CCEA old child limit for full-time students
 CCESYNG CCEA young child limit for full-time students
 CCEZOPT CCE young kid optimization rules [1=use, 2=zero,
 3=optimize]

INPUT VARIABLES:

cfinch First child in census family [pointer]
 cfineld Eldest person in census family [pointer]
 cfinspo Spouse of eldest [pointer]
 cfnkids Number of children in census family
 cfspoflg Census family contains married couple
 hhncf Number of census families in household
 idage Age
 idccet Child care expenses associated with child
 idccett Child care expenses (Limit A, Form T778)
 ideducm Eligible months of education allowance
 idiemp Wages & salaries
 idisefm Self-employed income - farming
 idisenf Self-employed income - non-farming
 idsex Sex
 imccez Is CCE zeroed?
 imisa Social assistance (or replacement program)

OUTPUT VARIABLES:

imccea Child care expenses allowed
 imccect Child care expenses claimed on behalf of child
 imdedft Deductions from total income
 iminet Net income
 imninc No income flag

txctc Compute child tax credit

SUMMARY

The federal Child Tax Credit and the Child Tax Benefit provide benefits to help low and middle income families meet the costs of raising children under the age of 18. The txctc function calculates benefits from the federal Child Tax Credit (CTC) program based upon the number of children in a family and the net income of the family. The function has a parameterized option for including GIS/SPA and social assistance benefits in the definition of net income.

The level of benefits varies with the number of children.

Program Description

The federal Child Tax Credit provides benefits to help low and middle income families meet the costs of raising children under the age of 18. It was implemented in 1979 and is administered by Revenue Canada, Taxation, through the income tax system.

Any person who receives Family Allowances is eligible to apply for the Child Tax Credit. The credit is available on behalf of a child for whom Family Allowances were paid for in the month of January following a given taxation year. An eligible person who voluntarily refrains from receiving Family Allowances may still claim the Child Tax Credit. The CTC must be applied for by filing an income tax return regardless of the income of the eligible parent or guardian. A foster parent in receipt of Special Allowances is not eligible for the CTC. Canadian residents living outside Canada, but paying Canadian taxes may apply for the credit.

The amount of the CTC is determined by the number of eligible children and the family's income. Family income is defined as the net income (as defined for income tax purposes) of both parents, whether married or not (provided they are living together), or the net income of a single parent. The net income of any other person who is claiming a personal exemption for a dependent child (whether or not the person lives with the claimant of the CTC) must also be included in family income. For families with taxable incomes the refundable credit to which they are entitled reduces the tax which must be paid; families whose taxes are less than the credit, or who pay no taxes at all receive a non-taxable lump sum payment.

The maximum annual credit is payable if net family annual income is less than a specified level of income called a benefit reduction level or turndown. Families with net incomes above this turndown are entitled to the maximum credit minus a specified percentage (reduction rate) of their net income in excess of the reduction point. The minimum CTC for eligible parent(s) is zero. In 1984 the maximum credit was \$367, the reduction point was \$26,330 and the reduction rate was 5%. So, for example, a family with two eligible children and a net income of \$40,000 would receive a tax credit of \$50.50. The 1984 credit becomes zero for families with a net income at or above \$41,010.

In 1993, the CTC was replaced by the Child Tax Benefit. This program is comprised of two parts: the basic Child Tax Benefit, and the Earnings supplement (also called the Working income supplement). The basic child tax benefit consists of \$1,020 per child, plus \$75 for the third child and subsequent children. There is an additional \$213 for each child under 7 with no child care expenses. The benefit is reduced at family incomes over \$25,921 at a 5% rate (or 2.5% if only 1 child).

The Working Income Supplement was a maximum of \$500 per family. It started at earnings of \$3,750, reached the maximum at earnings of \$10,000, and was then reduced, reaching \$0 at family incomes of \$25,921.

In 1997, the Working Income Supplement was enriched. Instead of \$500 per family, the benefit was \$605 for the first child, \$405 for the second child, and \$330 for the third and subsequent children. It was phased in at family earnings of \$3,750, reached a maximum at \$10,000, and was phased out starting at family incomes of \$20,921. The reduction rates were 12.1% for families with 1 child, 20.2% for families with 2 children, and 26.8% for families with 3 or more children.

In 1998, the program was renamed the Canada Child Tax Benefit (CCTB). The basic benefit has the same level and structure of the Child Tax Benefit. The Working Income Supplement

was replaced by the CCTB National Child Benefit Supplement. It is no longer dependent on earnings, and therefore is not phased in. Otherwise, it follows the same rules as the 1997 Working Income Supplement.

SPSM Implementation

The `txctc` function calculates the federal Child Tax Credit based on the number of children in a family and the net income of the family. Residency requirements are deemed to have been met in all cases. The function always allocates the Child Tax Credit to the mother unless one is not present in the nuclear family. The function only outputs a value for the federal child tax credit and this reflects the total value of the credit, whether used to reduce taxes, or received as a cash lump sum amount, or some mix of the two.

The `txctc` function operates at the nuclear family level. It first calculates a local variable for the family's net income by adding the eldest member's net income and that of their spouse (married or common-law) if present. The function optionally adds GIS, SPA, and Social Assistance benefits to family net income if the parameter `CTCIFLAG` is turned on. The maximum benefits for the family are then obtained by multiplying the number of children in the nuclear family by the maximum benefit per child (`nfkids * CTCPC`). The maximum CTC is then reduced at the specified reduction rate (`CTCRR`) applied to family net income in excess of the CTC turndown (`CTCTD`). This reduction is performed using the `taxbak1` function. Finally the federal Child Tax Credit is assigned to the mother if present and otherwise to the eldest member of the nuclear family.

When the `FCBEIE` flag is turned on, the Working Income Supplement has a different rate according to the number of children in the household, `FCBEIS1`, `FCBEIS2`, `FCBEIS3` and is also reduced at varying rates, `FCBERR1`, `FCBERR2`, `FCBERR3`. The enriched WIS is phased in starting at family incomes `FCBECI` and reaches its maximum at `FCBEMX`. The phase in rate is linear and depends again on the number of children in the family.

There was also a fix for the Quebec child tax benefits. The benefits (`QCBC3`) are now being assigned to the third and each additional child in a family.

Interpretation

Results obtained from the SPSM with respect to Child Tax Credit benefits differ from Revenue Canada administrative data. Overall the SPSM reports 101.9% more 1984 tax year benefits than does Revenue Canada for provincial Canada. However, the number of children for which the credit is paid is 99.6% of Revenue Canada's figures. One would expect the number of children on the SPSD to be low due to the non-coverage of persons residing on reservations and outside Canada. Thus there would seem to be a small deficit on the SPSD in the net income of families with eligible children.

Relation to Other SPSM Routines

The `txctc` function is called by `drv`. The function outputs one dollar value variable that is used in `memo1` for reporting purposes.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ACBC1	Alberta Child benefit per child aged 0 - 6
ACBC2	Alberta Child benefit per child aged 7 - 11
ACBC3	Alberta Child benefit per child aged 12- 15
ACBC4	Alberta Child benefit per child aged 16- 17
CTCERF	CTC child care expense reduction fraction
CTCIFLAG	Refundable tax credits social assistance income inclusion flag
CTCINC	CTC family income scaling factor
CTCOPT	Child tax credit option
CTCPC	Child tax credit per child
CTCREF	CTC post-reform rules flag
CTCRR	Child tax credit reduction rate
CTCSUP	CTC young child supplement
CTCTD	Family income child tax credit turndown
CTCTUR	CTC take up rate table [benefit,rate]
FCBBAS	Basic child benefit (per child)
FCBECI	Child benefits earning supplement cut-in level
FCBEIE	Flag for WIS dependent on number of children
FCBEIS	Child benefits earned income supplement
FCBEIS1	Enriched WIS for first child
FCBEIS2	Enriched WIS for second child
FCBEIS3	Enriched WIS for each additional child
FCBEMX	Earnings where WIS phase-in is at maximum
FCBERR	Child benefits earning supplement reduction rate
FCBERR1	WIS reduction rate for families with 1 child
FCBERR2	WIS reduction rate for families with 2 children
FCBERR3	WIS reduction rate for families with 3+ children
FCBESR	Child benefits earned income supplement rate
FCBETD	Child benefits earning supplement turndown level
FCBLRG	Supplement for 3rd and subsequent kids
FCBRR	Multi-children family income reduction rate
FCBRRS	Single-child family income reduction rate
FCBTD	Federal child benefits family income turndown
FCBYNG	Supplement for children under age 7
FCBYNGR	Child care expense reduction rate
PYINC	Deflator to calculate previous year income
QCBC1	Quebec Child benefit for 1st child
QCBC2	Quebec Child benefit for 2nd child
QCBC3	Quebec Child benefit for 3rd child
QCBCFLG	Quebec Child benefit flag for Quebec calculation methodology
QCBCS	Quebec Child benefit supplement child aged 12- 17
INPUT VARIABLES:	
cfinch	First child in census family [pointer]
cfinseld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]

cfnchild	Number of children (including 18+)
cfspoflg	Census family contains married couple
hdprov	Province
hhncf	Number of census families in household
hhnnf	Number of nuclear families in household
idage	Age
idiemp	Wages & salaries
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idrand	Random numbers [array]
idsex	Sex
imcce	Child care expenses claimed on behalf of child
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
nfinch	First child in nuclear family [pointer]
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imctc	Child tax credit
imfcben	Total Federal Child Benefits
imfcbenb	Total Federal Child Benefits Base
imfcbene	Total Federal Child Benefits Earning suppl
imninc	No income flag

txfstc Compute federal sales tax credit

SUMMARY

The refundable federal Sales Tax Credit provides benefits to help low income families offset the costs of federal sales taxes. The `txfstc` function calculates benefits from the federal Sales Tax Credit (STC) program based upon the number and type of persons in a family and the net income of the head and spouse. The function has a parameterized option for including GIS/SPA and social assistance benefits in the definition of net income.

Program Description

The refundable federal Sales Tax Credit provides benefits to help low income families offset the costs of federal sales taxes. It was implemented for the 1986 and subsequent tax years and is administered by Revenue Canada, Taxation, through the income tax system.

Upon application, through the filing of an income tax return, the federal sales tax credit is available to any individual who at the end of the year was married, had a child, or was over 18 years of age. Eligible individuals may claim the credit for themselves, their qualified relations, and one spouse. Individuals who are not subject to tax in Canada or who were

confined to a prison or similar institution for a period of over six months in the year for which a claim is made may not claim the credit. A married couple may make only one claim.

Maximum family benefits are a function of the type and number of individuals in the family as well as the net income of the family. There are three individual credit maximums; one for the filer; one for a spouse with whom the filer resided at the end of the year; and one for any other person under the age of 18 at the end of the year who was a child of the individual or their spouse or was a person in respect of whom the individual or his spouse has claimed a personal deduction. Family net income is the net income, for tax purposes, of the head of the family and their spouse if present.

The maximum annual credit is payable if net family annual income is less than a specified level of income (called turndowns, exemptions, or benefit reduction levels). Families with net incomes above this reduction point are entitled to the maximum credit minus a specified percentage (reduction rate) of their net income in excess of the reduction point. The minimum STC is zero. In 1986 the maximum credit was \$50 per adult and \$25 per dependent child, the reduction point was \$15,000 and the reduction rate was 5%. So, for example, a family with a spouse and two eligible children and a net income of \$17,000 would receive a tax credit of \$100.00. (The 1986 credit becomes zero for families of this type with a net income at or above \$18,000.)

SPSM Implementation

The `txfstc` function calculates the federal Sales Tax Credit based on the number, age, and type of persons in a family and the net income of the family. The function always allocates the Sales Tax Credit to the spouse with the higher net income in the nuclear family. The function outputs values for the federal Sales Tax Credit and these reflect the total value of the credit, whether used to reduce taxes, or received as a cash lump sum amount, or some mix of the two.

The `txfstc` function operates at the nuclear family level. It first increments two local variables based on information on the eldest member of the nuclear family; one for the family's net income by adding the eldest member's net income; and one for the maximum family benefits by adding the maximum entitlement for a filer. The program next increments both local variables for the spouse (married or common-law) if present. The function optionally adds GIS, SPA, and Social Assistance benefits to family net income if the parameter `CTCIFLAG` is set to one. The maximum benefits for the family are incremented last by multiplying the number of children in the nuclear family by the maximum benefit per child (`nfnkids * FSTCC`). The maximum STC is then reduced at the specified reduction rate (`FSTCR`) applied to family net income in excess of the STC reduction point (`FSTCL`). This reduction is performed using the `taxbak1` function. Finally the federal Sales Tax Credit is assigned to the mother if present and otherwise to the eldest member of the nuclear family.

When `FSTCREF` is set to 1, the federal sales tax credit is claimable at age 19. Parents may claim additional amounts for children aged 18 and younger. When the flag is set to 0, the credit is claimable at age 18 and only children aged 17 and younger can be claimed by their parents. This change required a shift from nuclear family loop to census family loop.

When calculating the GST credit, the income concept used is the previous year's incomes. The GST credit for a given year, say 1992, would represent the amounts paid from July 1992 to July 1993.

Interpretation

Results obtained from the SPSM with respect to Sales Tax Credit benefits have no valid Revenue Canada administrative data with which to compare the results. In general, the SPSM should be slightly low due to certain coverage issues. Further analysis will be required to correctly estimate who in a married couple is claiming the benefit. Take-up issues may also be relevant.

Relief for Heating Expenses

When HEATRLFLG is turned on, persons will receive a transfer from the federal government for the relief of heating expenses (imheatrl). In order to receive it, a person has to have received a GST credit (imfstc). Qualifying persons who live with a spouse or children receive HEATFAM and others receive HEATSNG.

Note that, as indicated in the federal economic statement 2000, in order to receive a check in 2001 a person had to qualify for the GST credit in January 2001 or June 2000. In the SPSM this is the modeled GST credit for 2000 (we assume that the entire check is given in June), based on 1999 income. In order to simplify the code, we used receipt of the 2001 GST credit as a proxy for receipt of the 2000 GST credit. Given the fact that there were no change in rules governing the GST credit in these two years, this should have a small effect.

Relation to Other SPSM Routines

The txfstc function is called by drv. The function outputs one variable that is used in memo1 for reporting purposes. The function makes use of (calls) the taxbak1 function.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTCIFLAG	Refundable tax credits social assistance income inclusion flag
FSTCC	Federal sales tax credit amount for dependant
FSTCF	Federal sales tax credit amount for filer
FSTCFLAG	Federal sales tax credit flag
FSTCL	Federal sales tax credit reduction level
FSTCR	Federal sales tax credit reduction rate
FSTCREF	Federal sales tax credit reform - age

FSTCS	Federal sales tax credit amount for spouse
GSTAC	GST additional credit amount
GSTAR	GST additional credit rate of net income
GSTASPFLAG	Maximum GST additional credit for single parents flag
GSTAXM	GST additional credit exemption
GSTCTUNC	GST credit take up by number of children
GSTFLAG	GST credit activation flag
HEATFAM	Federal relief for heating expenses for families
HEATRLFLG	Federal relief for heating expenses activation flag
HEATSNG	Federal relief for heating expenses for singles
PYINC	Deflator to calculate previous year income

INPUT VARIABLES:

cfageeld	Age of eldest in census family
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfspoflg	Census family contains married couple
hhncf	Number of census families in household
idage	Age
idrand	Random numbers [array]
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income

OUTPUT VARIABLES:

imfstc	Federal sales tax credit
imheatrl	Federal relief for heating expenses
imninc	No income flag

txhexp Compute and pro-rate household taxes, rent, etc.

SUMMARY

When IMSHTOPT is set to 1, imputation of provincial paid rents and property taxes are calculated based on Greenbook data, when set to .2 they are based on FAMEX. The rent and property tax are imputed to head's of census families and census family spouses reporting positive net income.

CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

CTFAMSNA	FAMEX->SNA conceptual conversion factor [com]
CTFTOT	Federal total retail tax equivalent
CTPTOT	Provincial total retail tax equivalent
IMSHTOPT	Paid rent and property tax imputation option

INPUT VARIABLES:

fxio	I/O expenditure categories [array]
fxprtax	Property tax
fxtptax	Transfer of Property taxes
hdprov	Province
hhnin	Number of individuals in household
idcfrh	Relationship to census family head
idhhrh	Relationship to head of household
idproptx	Net property taxes paid (556)
idrentpd	Total rental payments (555)

OUTPUT VARIABLES:

improptx	Imputed property tax paid
imrentpd	Imputed rent paid

txhstr	Compute family-related deductions or credits
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SUMMARY

This function calculates exemptions or tax credits for dependants as well as performing transfers of deductions between spouses. The algorithms included in this function are:

- calculate and allocate Personal Exemptions or Tax Credits for Wholly Dependant Children
- calculate and allocate Spouse (or Married) Exemption or Tax Credit
- calculate Spouse (or Married) Equivalent Exemption or Tax Credit
- calculate Deductions Transferred from Spouse

Calculate and Allocate Personal Exemptions or Tax Credits for Wholly Dependant Children

Before 1988, filers with dependant children were eligible to claim a personal exemption based upon the age and net income of the child. The exemption was calculated as a fixed amount (adjusted annually) minus a proportion of the child's income exceeding the reduction level. The amounts varied with the age of the child. Children under 18 years of age were

treated differently from children 18 and over. This claim could be split between supporting parents or grandparents.

The June 1987 White Paper on Tax Reform proposed the conversion of the exemption on behalf of children under 18 into a tax credit and the elimination of the exemption for children 18 and over.

SPSM Implementation

The parameter PEROPT controls whether personal exemptions or personal tax credits are calculated. If personal exemptions are calculated PEROPT=1, the amount of the exemption on behalf of each child under 18 is calculated by subtracting a proportion (YCXMR) of the child's Net Income (iminet) which exceeds the reduction level (YCXMT) from the Maximum Exemption (YCXM).

If the child is 18 or over but still under 21, or if the child is 21 or over and still in school (idestat=0), the amount of the exemption is calculated by subtracting a proportion (OCXMR) of the child's Net Income (iminet) which exceeds the reduction level (OCXMT) from the Maximum Exemption (OCXM).

The amounts for all children are accumulated in cdedd which may later be adjusted by the calculation of the Spouse Equivalent Exemption. If a spouse is present, the one with the higher Net Income (iminet) receives the full amount of the exemption for all dependant children (imcdedd) which is used to reduce Taxable Income (imitax) for that filer.

If personal tax credits are calculated (PEROPT=2), the amount of the tax credit on behalf of dependants under 18 is calculated by subtracting a proportion (YCTCR) of the child's Net Income (iminet) which exceeds the Reduction Level (YCTCT) from the Maximum Young Child Tax Credit (YCTC).

The amounts for all children are accumulated in ctxct which may later be adjusted by the calculation of the Spouse Equivalent Tax Credit. If a spouse is present, the one with the higher Net Income iminet receives the full amount of the tax credit for all dependent children (imctxcs) which is used to reduce Basic Federal Tax imbft in the function txcalc.

There is no tax credit for dependent children 18 and over. The model has no provision for a tax credit for infirm dependants aged 18 and over.

The model does not partition exemptions for wholly dependant children between spouses as is allowed in tax regulations. If it were partitioned, certain families would pay slightly lower taxes.

Married Exemption or Spouse Tax Credit

Persons legally married during the taxation year are eligible to claim a Married Exemption or Spouse Tax Credit. Before 1988, the Married Exemption amounted to a fixed value reduced by a proportion of the spouse's net income exceeding a specified level. Net income for this purpose includes the spouse's GIS/SPA benefits.

The June 1987 White Paper on Tax Reform proposed the conversion of this exemption into a non-refundable tax credit. The tax credit amounts to a fixed amount reduced by a proportion of the spouse's net income exceeding a specified level.

SPSM Implementation

The parameter PEROPT controls whether the Married Exemption or Spouse Tax Credit is calculated. If the Married Exemption is calculated (PEROPT=1) the Modeled Married Exemption (immarex) amounts to the Maximum Married Exemption (MXM) reduced by a proportion (MXMR) of the spouse's Net Income (iminet) exceeding the reduction level (MXMT). Note that (iminet) does not include spouse's GIS/SPA benefits. This is calculated only for the spouse with the higher Net Income. The Married Exemption (immarex) is added to Total Personal Exemptions (impex) which is subsequently used to reduce the Taxable Income (imitax) of the claiming spouse.

If the Spouse Tax Credit is calculated, the credit (immartxc) amounts to a fixed value (STC) reduced by a proportion (STCR) of the spouse's Net Income (iminet) exceeding the reduction level (STCT). This is calculated only for the spouse with the higher Net Income.

The Spouse Tax Credit (immartxc) is used to reduce Basic Federal Tax in the function txcalc.

Although the regulations allow special considerations for persons who changed marital status during the taxation year, they are not implemented in the model.

Married Equivalent Exemption or Spouse Tax Credit

Filers who are single, divorced, separated or widowed and supported a relative related by blood, marriage or adoption are eligible to claim that relative for the Married Equivalent Exemption or, post-reform a Spouse Tax Credit.

Before 1988, the Married Equivalent Exemption amounted to a fixed value reduced by a proportion of the dependent's net income exceeding a reduction level. The June 1987 White Paper on Tax Reform proposed the conversion of this exemption into a tax credit amounting to a fixed value reduced by a proportion of the relative's net income exceeding a reduction level.

SPSM Implementation

The parameter PEROPT controls whether a Married Equivalent Exemption or Spouse Equivalent Tax Credit is calculated.

If PEROPT is set to 1, the Married Equivalent Exemption is calculated. The SPSM only calculates the exemption on behalf of dependant children, not other relatives who may be eligible. The model attempts to make the claim on behalf of the dependant for whom a claim will benefit the filer most. The first choice for the exemption is a dependant who is not claimable for the Wholly Dependand Child Exemption, i.e., one who is over 21, is not attending school full-time, and has a Net Income (iminet) less than the Basic Personal Exemption (BXM). If there is no such dependant, the one with the lowest Net Income

(iminet) is chosen.

The exemption (immarex) is calculated as a fixed amount (EXM) reduced by a proportion (MXMR) of the dependant's Net Income (iminet) exceeding the Reduction Level (MXMT). If the exemption is calculated on behalf of a dependant who has already been accumulated into the total exemption for Wholly Dependant Children (cdeds), the amount claimed for that dependant (cdedt) is subtracted from cdeds, and the number of children claimed (chclm) is reduced by one.

The Married Equivalent Exemption (immarex) is added to Total Personal Exemptions (impex) and subtracted from Taxable Income imitax.

If PEROPT is set to 2, the Spouse Equivalent Tax Credit (immartxc) is calculated. The SPSM calculates the credit on behalf of dependant children, not other relatives who may be eligible. The algorithm parallels the calculation of the Married Equivalent Exemption. If a non-claimable dependant is present, he or she is chosen to be claimed for the credit. If there is no such dependant, then the one with the lowest Net Income (iminet) is claimed.

The credit is calculated as a fixed amount (ESTC) reduced by a proportion (STCR) of the dependant's Net Income (iminet) exceeding the reduction level (STCT). If the credit is being claimed on behalf of a dependant who is also eligible for the Wholly Dependant Child Tax Credit, the amount claimed for that dependant (ctxcm) is subtracted from the total Wholly Dependant Child Tax Credit (ctxcs) and the total number of children claimed (chclm) is reduced by one.

The Spouse Equivalent Tax Credit is added to Total Nontransferable Tax Credits (imtaxcr) which is subtracted from Basic Federal Tax (imbft) in the function txcalc.

Calculate Deductions Transferred from Spouse

Before 1988, certain deductions not required to reduce a filer's net income to zero could be transferred to the filer's spouse. The following deductions were transferable:

- Age Exemption
- Interest and Dividend Income Deduction
- Pension Income Deduction
- Disability Deduction
- Education Deduction

The total amount of deductions transferred from the spouse is the amount not required to reduce the spouse's taxable income to zero. There is also a limit on the amount of combined Interest and Dividend Income Deduction and Pension Income Deduction transferred which amounts to the unused portion of the Married Exemption, i.e., if the full Married Exemption was claimed then no portion of these two deductions may be transferred.

The June 1987 White Paper on Tax Reform proposed the conversion of some of these deductions into tax credits, the elimination of the Interest and Dividend Income Deduction and the addition of the Tuition Tax Credit as a transferable credit. Since the algorithms for

performing the transfer of tax credits are in the function txcalc, they are documented in the section which describes that function.

SPSM Implementation

The parameter PEROPT controls whether deductions or tax credits are calculated. If PEROPT is 1, then transferable deductions are calculated in the function txhstr. If PEROPT is 2, then transferable deductions are not calculated. The function txcalc calculates the transfer of tax credits independent of the value of PEROPT.

If transferable deductions are calculated, then for the spouse with the lower Net Income (iminet), potentially transferable deductions (dedt) are calculated as the sum of:

- Age Exemption (imaxm),
- Disability Deduction (imdisex),
- Education Deduction (imeduc), and the lesser of:
 - a) total Pension Income Deduction (impendn) and Interest Income Deduction (imintdn), and
 - b) the unused portion of the Married Exemption (MXM - marrex).

The amount transferred is limited to the amount not required to reduce the spouse's taxable income to zero by subtracting from the above total the amount by which the spouse's Net Income (iminet) exceeds the Basic Personal Exemption (BXM).

The amount transferred from the spouse (dedt) is subtracted from the filer's Taxable Income (imitax) and added to Total Deductions from Net Income (imdedfn). The spouse's Taxable Income and deductions are not adjusted since Taxable Income is zero. The amounts recorded for the individual deductions (e.g., imaxm, impendn) are not adjusted to reflect the transfer.

Calculate supplement to the basic personal tax credit

The supplement to the basic personal tax credit announced in the 1998 federal budget is calculated by reducing the maximum supplement (BXMS) by a proportion (BXMSRR) of taxable income above the level of the basic exemption (BXM) plus the maximum supplement (BXMS). The supplement is added to the basic personal tax credit (imbtc). Persons who claim the married amount or equivalent-to-spouse amount get an additional supplement. This program was cancelled in the 1999 federal budget.

CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

BXM	Basic personal exemption/amount
BXMS	Basic personal exemption supplement

BXMSPI	Basic personal exemption supplement phase in
BXMSRR	Basic personal exemption supplement reduction rate
DEPNIFG	Include SA, etc. in dependant's net income
EMXM	Married equivalent exemption/amount
EMXMT	Married equivalent exemption/amount turndown level
FNTCR	Federal non-refundable tax credit rate
MXM	Married exemption/amount
MXMT	Married exemption/amount turndown level
OCXM	Exemption for old dependent child
OCXMR	Exemption reduction rate for old dependent child
OCXMT	Exemption turndown for old dependent child
PEROPT	Personal exemption/credit option [1=deduction,2=credit]
YCXM	Dependent child exemption
YCXM1	Dependent child amount (1st child)
YCXM2	Dependent child amount (2nd child)
YCXM3	Dependent child amount (3rd ,etc.)
YCXMR	Dependent child exemption reduction rate
YCXMT	Dependent child exemption/amount turndown level

INPUT VARIABLES:

cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfspoflg	Census family contains married couple
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idestat	Educational status
imaxm	Age personal exemption
imdisex	Disability exemption
imeduc	Education allowance for student (322)
imigis	GIS benefits
iminet	Net income
imintdn	Interest income deduction allowed
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
impendn	Pension income deduction allowed

OUTPUT VARIABLES:

imbtcsc	Basic personal tax credit supplement
imcchc	Child's non-refundable credit
imcdeds	Dependent children deductions
imcemc	Child's equivalent to married credit
imchclm	Number of dependent children claimed
imctxcs	Dependent children tax credits
imdedfn	All deductions from net income
imdedt	Deductions transferred from spouse
imdepni	Dependant's net income
imitax	Taxable income
immarex	Married exemption claimed
immartxc	Married tax credit claimed
impex	All personal exemptions and deductions

SUMMARY

The txinet function contains several algorithms which are required to calculate net income. The algorithms calculate the following specific tax measures which are discussed in order in terms of the description of the tax measure and its SPSM implementation.

- Employment Expense Deduction
- Other Allowable Employment Expenses
- Calculate Taxable Dividends
- Calculate Taxable Capital Gains
- Calculate Total Income
- CPP/QPP Contributions (Deduction or Tax Credit)
- Unemployment Insurance Contributions (Deduction or Tax Credit)
- Tuition Fees (Deduction or Tax Credit)
- Calculate all deductions from total income
- Assign Taxable portion of Family Allowance to head or spouse
- Calculate Net Income

Program Description

Employment Expense Deduction

This is used to reduce employment income before it is added in to total income. The June 1987 White Paper on Tax Reform proposed the elimination of this deduction beginning with taxation year 1988.

The flag EAOPT controls whether the Employment Expense Deduction is calculated. With a value of 1, imdedea is calculated. If EAOPT is set to 2, imdedea is set to zero.

The Employment Expense Deduction (imdedea) is a deduction from Total Employment Earnings (idiemp) It is calculated as a proportion (EAPRP) of Total Employment Earnings up to a specified maximum (EAMAX).

Other Allowable Employment Expenses

Certain special employment expenses not claimable elsewhere are allowed.

According to the 1984 definition, these expenses include:

- employee's expenses for travel, office and wages to assistants,
- commission sales employees may claim certain expenses paid to earn their income,
- transport employees may deduct the cost of meals and lodging while away from home, and
- power saw operators may claim expenses incurred in operating the power saw.

This is a special deduction from employment income and is not available to most employees. SPSM Implementation

The value for Other Allowable Employment Expenses (idalexp) already exists on the database. This value is derived from actual taxation statistics. For more details, please see the *Database Creation Guide*. This value is multiplied by the parameter ALEXPP (Proportion of Other Allowable Expenses to Use as a Deduction) to obtain imalexp, the modeled amount for Other Allowable Expenses.

Calculate Taxable Capital Gains

Capital Gains arise when an individual sells a property for more than it originally cost. If a property is sold for less than it cost, a capital loss may be claimable.

Only a portion of Capital Gains received are considered taxable. Similarly only a portion of capital losses may be claimed as a loss. The value of idicapg represents the actual amount of the Capital Gain or Loss Allowed. Losses, in 1984, were limited to \$2,000. This represents the lower limit of the variable idicapg. Modeled Taxable Capital Gains or Losses imicapgt are calculated by multiplying idicapg by the Capital Gains Inclusion Rate (CAPGIR).

Calculate Taxable Dividends

To avoid double taxation of dividends earned in Canadian business, the dividends from taxable Canadian corporations are treated differently from other sources of income. Before taxation, these dividends are "grossed-up" or increased to an amount which approximates the underlying corporate tax already paid on these earnings. A Dividend Tax Credit is paid based on the grossed-up amount and approximated the corporate taxes already paid.

The gross-up tax credit system ensures that income earned by Canadian corporations and then distributed in the form of dividends bears the same amount of total tax as if the income were earned directly by the shareholders.

SPSM Implementation

Total Dividends Received is represented on the database by the variable idivid. The taxable amount (imidivt) which is added to total income is calculated by multiplying idivid by the Federal Dividend Gross-up Rate (FDGUR).

Calculation of Total Income

At this point, the SPSM is able to calculate a first approximation of total income for tax purposes. This is not a final value since Family Allowances cannot be allocated to the mother or father until the Net Income of both is known. This temporary value of Total Income (itot) is the sum of:

idiemp:	Earnings From Employment
idisenf:	Self-employment Earnings (Non-farm), optionally scaled by the parameter FACTISENF
idisefm:	Self-employment Earnings (Farm)

idiint:	Interest Income
idioinv:	Other Investment Income
idicqp:	CPP/QPP Benefits Received
iditogy:	Other Taxable Government Income
idipens:	Pension Income
iditoth:	Other Taxable Income
imiuib:	Modeled Unemployment Insurance Benefits Received
imiotg:	Modeled New Taxable Demogrants
imioas:	Modeled OAS Benefits
imidivt:	Modeled Taxable Amount of Dividends
imicapgt:	Modeled Taxable Capital Gains and Losses

From this total, the two deductions from employment income are subtracted:

- imalexp: Modeled Other Allowable Employment Expenses
- imdedea: Modeled Employment Allowance

Calculate CPP/QPP Contribution Deduction or Tax Credit

All Canadians aged 18 to 64 and in the labour force are covered by either the Canada Pension Plan (CPP) or the Quebec Pension Plan (QPP). The pension plans provide retirement benefits as well as survivor benefits for a widow or dependant when the contributor dies prematurely, a death benefit and disability benefits. The plans are publicly funded, based on contributions from all employed persons aged 18 to 70 with pensionable earnings.

Contributions to the Canada and Quebec Pension Plans are based on employment income and are usually made through payroll deductions. Self-employed persons make their contribution through the tax system, the amount of the contribution is added to federal taxes payable.

The amount contributed is not subject to taxation and is therefore either deducted from total income or treated as a tax credit.

In most cases, an employee and his or her employer will contribute the same amount to the employee's pension plan. Self-employed persons contribute a twice the rate of employees.

Although employees have their CPP/QPP contribution deducted from their paycheck, refunds for overpayment are made through the personal income tax system.

SPSM Implementation

CPP/QPP Contributions are calculated separately on employment and self-employment earnings. Employment earnings subject to contribution are calculated by subtracting the amount of exemptable earnings (CPPXM) from Earnings from Employment (idiemp). This amount cannot exceed the Maximum Earnings Subject to Contribution (YMPE minus CPPXM). Earnings Subject to Contribution are then multiplied by the CPP/QPP contribution rate (WSCF) to derive the amount of the contribution (wscon).

Contributions from self-employment earnings (secon) is a proportion (SECF) of Earnings from Employment (idiemp) plus Earnings from Self-employment (idisenf + idisefm) that are in excess of the Annual Exemption Level (CPPXM) and less than the year's Maximum Pensionable Earnings Level, less a multiple (WSCM) of contributions made on Earnings from Employment (wscon). WSCM is the ratio of the contribution rate on earnings from self-employment to the rate on earnings from employment.

The total CPP/QPP Contribution is the sum of the Contribution Payable on Earnings from Employment (wscon) plus the Contribution Payable on Earnings from Self-employment (secon).

There is no information in the database concerning the actual amount deducted through payroll deductions; therefore, refunds for overpayment cannot be calculated.

The parameter CPPOPT determines whether CPP/QPP Contributions are treated as deductions from Total Income (CPPOPT=1) or as a non-refundable tax credit (CPPOPT=2). If they are treated as deductions from total income, the value imcqppc is added to Total Deductions from Total Income imdedft. If the contributions are treated as tax credits, the tax

credit (imcppctc) is calculated as a proportion (CPPCTR) of the total contributions (imcqqpc). The tax credit is applied in the function txcalc.

When CPPSEDEDFLG is turned on, a fraction (CPPSEDFRC) of a person's contributions to the CPP/QPP in regards to their self employment earnings are treated as an exemption (imcppse) and is added to imdedftf. The rest, along with the contributions on wages and salaries, can still be claimed as a tax credit (imcppctc).

Unemployment Insurance Contributions

Unemployment Insurance is intended to provide short-term financial support to the unemployed. It also provides benefits for those suffering from extended sickness, for women leaving the labour force temporarily because of pregnancy and childbirth, and supplementary benefits to unemployed fishermen and to persons undertaking manpower training courses. The program is given its mandate by the Unemployment Insurance Act (1971). The act covers nearly all members of the labour force except self-employed persons and those who earn less than the minimum insurable earnings. The program is funded by employee and employer contributions as well as additional revenue from the consolidated revenue fund.

Contributions are calculated as a proportion of weekly earnings. Only earnings above the minimum insurable earnings and less than the maximum insurable earnings are subject to contribution.

Unemployment Insurance premiums are deducted from the employee's paycheck by the employer. Reimbursements for overpayment are made through the tax system. The amount contributed is not subject to tax. Before 1988, UI contributions were deducted from total income. The June 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit.

Two major Employment Insurance Reforms were added, the difference in contributions, and the benefits repayable.

SPSM Implementation

The database contains no detail on an individual's weekly distribution of earnings throughout the year. Weekly earnings are estimated by dividing the annual Earnings from Employment (idiemp) by the Number of Weeks Worked (idlyww). This assumes that the earnings were evenly distributed throughout the year. It also assumes that the earner worked at least 20 hours during each week.

If the average weekly earnings thus calculated are less than the Minimum Weekly Insurable Earnings MNWEL, the contribution is zero. Otherwise, the annual UI Contribution (imuic) are calculated as a proportion (UIPF) of average weekly earnings not exceeding the Maximum Weekly Earnings Subject to Contribution (MXWEL), multiplied by the number of weeks worked.

The value of the parameter UICOPT determines whether UI contributions are treated as a deduction from total income (UICOPT=1) or as a non-refundable tax credit (UICOPT=2).

When treated as a deduction from total income, the UI Contributions (imuic) are added to the value of Total Deductions from Total Income (imdedft).

If UI contributions are to be treated as a tax credit (UICOPT=2), the UI Contribution Tax Credit (imuictc) is calculated as a proportion (UICTR) of the contributions. This tax credit is later applied to reduce Basic Federal Tax in the function txcalc.

When Employment Insurance is activated (UIEIOPT = 2), then the EI contributions (imuic) are calculated using the UI contribution rate on earnings (UIPF) with no weekly maximums and no exemptions for low income. The EI contribution refund (imuicrf) is then calculated and subtracted from the contributions.

The method of calculating UI/EI benefit recovery (imuibr) is also changed when UIEIOPT is activated. When UIEIREPOPT is set to 1, it now depends on the amount of previous weeks of EI received. If employment insurance benefits (imiuib) have been received and net income is in excess of: (a) UIBRA for persons with previous EI receipt, or (b) UIBRANR for persons with little previous benefits or for persons not on regular EI claims; UIEIRPR is applied to the lower of (a) total EI benefits and (b) the excess net income up to a maximum percent of their total benefits (UIEIBRP), to calculate the repayment.

When UIEIREPOPT is set to 2, sickness, maternity, and parental benefits are exempt from benefit repayment. Persons who claim EI for the first time are also exempt from benefit repayments. For the rest, the repayment is equal to the UIEIRPR times the minimum of net income in excess of UIBRANR and EI benefits.

See UIEIRPR, UIBRANR, UIEIBRP, UIBRA, and UIEINRT for more details.

Tuition Fees

Only the student may claim tuition fees paid to an educational institution as a deduction from total income. The June 1987 White Paper on Tax Reform proposed the conversion of this deduction into a tax credit which may be transferred to a spouse or supporting parent. The White Paper proposed a maximum of \$600 on the amount of combined Tuition and Education Tax Credit transferred.

SPSM Implementation

A value for Tuition Deduction Allowed in the base year (idtuitn) exists on the database. This value is imputed from income tax records (see the [*Database Creation Guide*](#)). The parameter TUITOPT determines whether tuition fees are considered a deduction from total income (TUITOPT=1) or as a tax credit (TUITOPT=2).

If tuition fees are treated as a deduction, the database value (idtuitn) is simply added to Total Deductions from Total Income (imdedft). If they are treated as tax credits, idtuitn is multiplied by the Tuition Fee Tax Credit Rate TUTCR and the result (imtutxc) is later applied as a tax credit in the function txcalc.

Assign Taxable Family Allowance

For tax purposes, Family Allowances are attributed to the person who claims a personal exemption (or post-reform, a tax credit) for the child. The model assumes that the exemptions are allocated to the spouse with the higher net income (iminet, excluding FA) if present. This is the spouse who would benefit most from claiming the children and, therefore, this is the one who also must claim Taxable Family Allowances.

Calculate Net Income

Net Income (iminet) is calculated as Total Income (imitot) minus All Deductions from Total Income (imdedft). imdedft is the sum of:

idrpp:	Registered Pension Plan Contributions
idrrsp:	Registered Retirement Savings Plan Contributions
iddues:	Union and Professional Dues
imiloss:	Allowable Business Investment Loss
idothded:	Other Deductions from Total Income (includes Moving Expenses, Alimony Paid, Repayment of Income Amounts, Legal and Accounting Fees, Petroleum Exploration Ventures, Capital Cost Allowance on Canadian Motion Picture Films and Video Tapes)
idcarry:	Carrying Charges (interest on money borrowed to earn investment income)
imcqpc:	optionally, CPP/QPP Contributions
imuic:	optionally, UI Contributions
idtuin:	optionally, Tuition Fees
imcce:	optionally, Child Care Expense Deduction Allowed (calculated separately in function txcea)

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ALEXDEDFLG	Other employment expenses deducted after total income calculation
ALEXPP	Proportion of other allowable employment expenses to use as deduction
CAPGIR	Capital gains inclusion rate
CPP60T64	CPP/QPP Contributions Take up (60 - 64) by earnings with CPP income
CPPGT64	CPP/QPP Contributions Take up (over 64) by earnings with CPP income
CPPLT60	CPP/QPP Contributions Take up (under 60) by earnings with CPP income

CPPOPT CPP/QPP contribution deduction/credit option
 [1=deduction,2=credit]
 CPPSEDEDFLG CPP/QPP contribution deduction for self-employed earnings
 flag
 CPPSEDFRC CPP/QPP contribution deduction fraction for self-employed
 earnings
 CPPXM CPP/QPP exemptible earnings
 EAMAX Maximum employment expenses
 EAOPT Employment expense calculation option [1=deduction,2=none]
 EAPRP Employment expenses allowed - percent
 FACTISENF Scale-up factor for non-farm self-employment income
 FARR Family allowance repayment rate
 FATBPI Family allowance take-back phase in
 FATD Family allowance turndown income
 FDGUR Federal dividend gross-up rate
 FNTCR Federal non-refundable tax credit rate
 NETOASFLG Net the clawback from Old Age Security
 OASRR OAS reduction rate
 OASTBPI OAS take-back phase in
 OASTD OAS turndown income
 REPNETFLAG Social program repayments reduce net income flag
 SECF CPP/QPP contribution rate on self-employment earnings
 TUITOPT Tuition deduction/credit option [1=deduction,2=credit]
 UIBRA UI repayment base amount (UI and EI)
 UIBRANR EI repayment base amount for non-repeaters (EI only)
 UIBRP UI benefit recovery portion (UI only)
 UICOPT UI contributions deduction/credit option
 [1=deduction,2=credit]
 UIEIBRP Maximum clawback under EI reform [Past Wks ben][Rate] (EI
 only)
 UIEINRT UI EI Non repeater level for higher clawback turndown (EI
 only)
 UIEIOPT UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
 UIEIREF EI contribution refund cut-in (EI only)
 UIEIREPOPT EI Benefit repayment option (1=repeaters have higher
 rate,2=one rate)(EI only)
 UIEIRPR UI EI benefit clawback rate (EI only)
 UIERNMAX Maximum insurable earnings (UI and EI)
 UIMINPCT Exemption limit (percent of maximum insurable earnings) (UI
 only)
 UIPF UI contribution rate on earnings (UI and EI)
 UITARGET UI/EI target for the number of cases (UI and EI)
 WSCF CPP/QPP contribution rate on employment earnings
 WSCM Ratio of self-employed to employed contribution fraction
 YMPE CPP/QPP maximum pensionable earnings

INPUT VARIABLES:

hdprov Province
 hhnin Number of individuals in household
 hhnnf Number of nuclear families in household
 idage Age
 idalexp Other allowable employment expenses (229)
 idcarry Carrying charges (221)
 iddalimo Alimony paid (220)
 iddues Union and professional dues (212)
 idexplor Exploration and development expenses (224)
 idicapg Capital gains (actual)

idicqpp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiint	Interest income (121)
idiloss	Business investment losses (217)
idioinv	Other investment income with net rental
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
iditrrsp	Taxable RRSP withdrawals
idlyww	Weeks worked
idmovexp	Imputed moving expenses (219)
idothded	Other deductions from total income (232)
idrand	Random numbers [array]
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idtuitn	Tuition fees (320)
iduirank	Predicted ranked likelihood of getting UI
imiotg	Other taxable demogrants
imiuib	Unemployment Insurance/Employment Insurance benefits
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple
ubcalpd	Benefits paid in calendar year
ubeiwbp	Weeks of past EI benefits
ucbtyp	Claim type
ucstat	Claim status flag

OUTPUT VARIABLES:

imalexp	Allowable employment expenses
imcppctc	CPP contributions tax credit
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedia	Employment allowance
imdedft	Deductions from total income
imfar	Family allowance recovery
imicapgt	Capital gains (taxable)
imidivt	Dividend income (taxable)
imiloss	Modelled Business investment losses (217)
iminet	Net income
imioas	OAS benefits
imitot	Total income
imnfach	Number of family allowance children claimed
imninc	No income flag
imoasr	OAS recovery
imqtfa	Quebec taxable family allowances
imrepay	Social Benefits Repayments
imtfa	Taxable family allowances
imtutxc	Tuition tax credit
imuibr	UI benefit recovery
imuic	UIC contributions
imuicrf	UI EI contribution refund
imuictc	UIC contributions tax credit

SUMMARY

The process of computing taxable income is divided into two separate routines. Exemptions, deductions and tax credits which are not dependent upon information from other members of the family (e.g., the Basic Personal Exemption or Basic Personal Tax Credit) are collected together in txitax. Algorithms which require information on the age, income or deductions of a spouse or dependant are in txhstr. txitax calculates a provisional value for taxable income (imitax) which may be further adjusted by txhstr.

The algorithms contained in txitax are:

- Basic Personal Exemption or Tax Credit
- Age Exemption or Tax Credit
- Pension Income Deduction
- Standard Deduction, Medical Expense Deduction or Tax Credit, Charitable Donations Deduction or Tax Credit
- Disability Deduction or Tax Credit
- Education Deduction or Tax Credit
- Capital Gains Deduction
- UI Benefit Repayment Payable
- Family Allowance and OAS Repayment Payable (optional)

Two deductions which are not included here are the Employee Home Relocation Deduction and the Stock Option and Shares Deduction. Forward averaging is also not implemented because of the filer's previous years tax information is not available.

Basic Personal Exemption or Tax Credit

For taxation years before 1988, all persons living in Canada claimed the Basic Personal Exemption which was adjusted annually. The June 1987 White Paper on Tax Reform proposed the conversion of this exemption (and many deductions), into non-refundable tax credits. Under this proposed tax reform, all Canadians would claim the Basic Personal Tax Credit.

The model allows the user to choose algorithms for either personal exemptions or personal tax credits by assigning the appropriate value to the parameter PEROPT. If PEROPT is set to 1, algorithms for the Basic Personal Exemption are executed (and others, see the description of PEROPT in the *Parameter Guide*). If PEROPT is assigned a value of 2, the algorithm for the Basic Personal Tax Credit is executed.

If the Basic Personal Exemption is calculated (PEROPT =1), the value assigned to the parameter BXM (Basic Personal Exemption) is added in to the variable imexm which

accumulates personal exemptions as they are calculated.

If the Basic Personal Tax Credit is calculated (PEROPT =2), the value assigned to the parameter BXM (Basic Personal Tax Credit) is assigned to the variable imbtc (Modeled Basic Personal Tax Credit) which is applied to reduce Basic Federal Tax in the function txcalc.

Age Exemption or Tax Credit

For taxation years before 1988, all Canadians who were 65 years of age or older on December 31st of the taxation year were eligible to claim the Age Exemption, the value of which was adjusted annually. The June 1987 White Paper on Tax Reform proposed the conversion of this exemption into a non-refundable tax credit. Under this tax reform, all Canadians who were 65 years of age or older on December 31st of the taxation year would be eligible to claim the Age Tax Credit.

The parameter AOPT is used to control whether the Age Exemption or Age Tax Credit is computed. If the Age Exemption is executed (AOPT =1), imaxm (Modeled Age Exemption) takes on the value assigned to the parameter AXM for all persons aged 65 and over. The value is also added to the variable imexm which accumulates personal exemption values as they are calculated. The value assigned to imaxm is used to calculate taxable income (imitax) by way of the variables imexm and impex (Total Personal Exemptions).

Since the Age Exemption is transferable between spouses, the value assigned to impex and imitax may be adjusted to reflect this transfer by the function txhstr. If the filer transfers the unused proportion of the Age Exemption the value of imaxm is not adjusted.

If the Age Tax Credit is calculated (AOPT =2), imatxc (Modeled Age Tax Credit) receives the value assigned to the parameter ATC. The function txcalc performs any applicable transfer of the tax credit from the spouse and applies the tax credit to reduce Basic Federal Tax.

The variable idage on the database, represents the age, in years, of the filer in April of 1984 (see the description of idage in the [Variable Guide](#)). This implies that those who turn 65 between May and December 1984 are not considered 65 years of age and therefore do not receive the Age Exemption or Tax Credit.

Pension Income Deduction or Tax Credit

Certain pension income from a pension plan or upon the death of a spouse qualifies for a Pension Income Deduction of Tax Credit. Before 1988, the deduction amounted to the lesser of the maximum deduction (fixed at \$1,000) and eligible income. Any amount of this deduction not required to reduce taxable income to zero is transferable to the spouse.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a tax credit amounting to a proportion of eligible income up to a maximum of \$170. This tax credit would also be transferable.

SPSM Implementation

The parameter YPNOPT controls whether the algorithms for Pension Income Deduction or Pension Tax Credit are executed. If the Pension Income Deduction is calculated (YPNOPT =1), impendn (Modeled Pension Income Deduction) is calculated as the minimum of:

- a) qualified pension income (idipens), and
- b) the Maximum Allowable Deduction (YPNDL)

Although the value of impendn is added to Total Deductions from Net Income (imdedfn) and thereby subtracted from net income (iminet), the values for imdedfn and iminet may be subsequently adjusted if any portion of this deduction is transferred to the spouse by the function txhstr. The value for impendn is not adjusted to reflect any transfers.

If the Pension Income Tax Credit is calculated (YPNOPT =2), impentxc (Modeled Pension Income Tax Credit) is assigned the minimum of:

- a) qualified pension income (idipens) times the Tax Credit Rate (FNTPCR), and
- b) the Maximum Allowable Tax Credit (YPNDL)

Any portion of the Pension Income Tax Credit not required to reduce a filer's Basic Federal Tax to zero is transferable to the spouse. The transfer is calculated in the function txcalc.

Interest and Dividend Income Deduction

In taxation years before 1988, interest income from Canadian sources and dividends from taxable Canadian corporations were eligible for an Interest and Dividend Income Deduction. In 1984 and before income from capital gains were also eligible.

The deduction amounted to the lesser of a fixed amount (\$1,000) and total eligible income. Any amount of the deduction not required to reduce taxable income to zero was transferable to the spouse.

The June, 1987 White Paper on Tax Reform proposed the elimination of this deduction beginning in taxation year 1988.

SPSM Implementation

Eligible income is calculated as the sum of:

- idiint: Interest Income
- imidivt: Modeled Taxable Dividends
- imicapgt: Modeled taxable capital gains (optional)

The parameter CGIFLAG controls whether taxable capital gains are included in the total of eligible income.

Carrying Charges (idcarry) are subtracted from this total. The Interest and Income Deduction (imintdn) is then calculated as the lesser of this eligible income and the Maximum Interest Income Deduction (YINDL).

The value of imintdn is added to Total Deductions from Net Income (imdedfn) which is subsequently subtracted from Net Income (iminet). Since this deduction is transferable between spouses, the function txhstr may later adjust the values of imdedfn and iminet to reflect the transfer. The value of imintdn is not adjusted if a transfer occurs and thus reflects the Eligible Interest Income Deduction and not the amount actually applied.

Medical Expense Deduction or Tax Credit

The filer is allowed a deduction or tax credit for certain medical expenses paid on behalf of the filer, spouse or dependants. Before 1984, combined medical expenses (in excess of 3% of net income) and charitable donations (not exceeding 20% of net income) under \$100 did not require supporting receipts. This was termed the Standard Deduction. In 1984 and subsequent years, all medical expenses claimed required supporting proof to be allowed as a deduction. Furthermore, only medical expenses in excess of 3% of net income were claimable.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit.

SPSM Implementation

A value of Allowable Medical Expense Deduction (idmedgro) exists on the database for each filer. This value represents the 1984 definition which represents medical expenses in excess of 3% of net income. Although medical expenses paid on behalf of dependants are claimable by either spouse, no transfers between spouses are made for this deduction.

The parameter MDCROPT determines the treatment of both medical expenses and charitable donations. If MDCROPT is assigned the value of 1, the combined Medical and Charitable Deduction (imstdn) is calculated as the greater of:

- (a) STDED: the Standard Deduction
- (b) idmeda + idchara: the sum of Net Medical Expenses, Charitable Donations and Gifts to Canada or a province

If MDCROPT is assigned a value of 2, a Medical Expense Tax Credit (immedatc) is calculated as a proportion (MEDTCR) of Net Medical Expenses (idmedgro). The Medical Expense Tax Credit is applied to reduce Basic Federal Tax in the function txcalc.

The current implementation of the database and model has no built-in way of allowing the user to change the calculation of medical expenses eligible for the deduction or tax credit. Although the June, 1987 White Paper on Tax Reform states that medical expenses in excess

of 3% of Net Income will be eligible of the tax credit, the post-reform definition of Net Income is different from the pre-reform definition. Since post-reform Net Income does not include deductions for CPP/QPP Contributions, UI Contributions, Tuition Fees or Child Care Expenses, it will be much higher than pre-reform for most filers. Unless otherwise adjusted, this decreases the amount of medical expenses eligible for the tax credit.

Charitable Donations Deduction or Tax Credit

The filer is allowed a deduction or tax credit on behalf of charitable donations and gifts to Canada or a province. Before 1984, combined medical expenses and charitable donations under \$100 did not require supporting receipts. This was termed the Standard Deduction.

In 1984, the Standard Deduction was eliminated and all claims for charitable donations required proof. Charitable Donations in excess of 20% of Net Income were not eligible for a deduction but could be carried forward. There was no limit on gifts to Canada or a province.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit.

SPSM Implementation

The database contains a value for eligible Charitable Donations and Gifts to Canada or a Province (idchara) according to the 1984 definition. The Charitable Donations component of this value is limited to 20% of Net Income.

The parameter MDCROPT determines whether this value is taken as a deduction from Net Income or is converted to a non-refundable tax credit.

If Charitable Donations and Gifts to Canada or a Province are to be treated as a deduction (MDCROPT=1), the combined Medical Expense and Charitable Donation Deduction (imstddn) is calculated as the greater of:

- (a) STDED: the Standard Deduction
- (b) idmeda + idchara: the sum of Net Medical Expenses, Charitable Donations and Gifts to Canada or a province

If charitable donations are to be treated as a tax credit (MDCROPT=2), a two-tier, non-refundable Charitable Donation Tax Credit (imchartc), is calculated. Donations up to a set amount (CHATL1) are converted at the first tax credit rate (CHATR1) and the remainder is converted at the second rate (CHATR2).

The Charitable Donations Tax Credit is a component of the total non-refundable tax credits used to calculate Basic Federal Tax in the function txcalc.

Disability Deduction or Tax Credit

Disabled persons whose impairment has markedly restricted or is expected to restrict their activities of daily living for a continuous period of at least 12 months are eligible to claim a special Disability Deduction or Tax Credit. Before 1988, the value of this deduction was

increased annually. Any unused portion of the deduction could be transferred to a supporting parent or grand-parent.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit set at \$550 in 1988 and increased annually by the annual growth in the Consumer Price Index minus 3 points. According to the White Paper, the tax assistance benefits approximately 250,000 Canadians annually.

SPSM Implementation

The database contains a variable representing the Disability Deduction Claimed (iddisex) in the base year (1984). The value represents the total amount claimed on behalf of the filer, spouse and dependents.

The parameter DISOPT controls whether this value is treated as a deduction from Net Income (DISOPT=1) or is converted to a tax credit (DISOPT=1).

If the Disability Deduction is calculated, the deduction (imdisex) takes on the value assigned to the parameter Maximum Disability Deduction (MAXDX) for all filer with a non-zero value on the database for iddisex .

Although the value of iddisex represents the amount of the Disability Deduction claimed, any portion of the calculated amount (imdisex) not required to reduce the filer's taxable income to zero may be transferred to the spouse. This transfer is made in the function txhstr which also makes the appropriate adjustments to Taxable Income (imitax) and Deductions from Net Income (imdedfn). The value of imdisex is not updated if a transfer occurs.

If the Disability Tax Credit is to be calculated (DISOPT=2), the Disability Tax Credit (imdisatc) is assigned the value of the parameter MAXDTC (Maximum Disability Tax Credit). Any portion of the tax credit not required to reduce Basic Federal Tax to zero may be transferred to the spouse or a supporting parent in the function txcalc.

Education Deduction or Tax Credit

Before 1988, students attending a designated post-secondary educational institution full-time were eligible to claim an Education Deduction which amounted to a flat rate per month of attendance. Any unused portion of the deduction was transferable to a supporting parent or spouse.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit. The amount of the tax credit was proposed to be a fixed rate per month of attendance. The White Paper proposed a maximum of \$600 on the amount of combined Education and Tuition Tax Credit transferred to a supporting parent or spouse.

SPSM Implementation

The parameter EDUCOPT controls whether education expenses are treated as a deduction (EDUCOPT =1) or a tax credit (EDUCOPT =2). The Education Deduction Allowed in 1984

already exists on the database (ideduc). Included in this amount is any transfer from dependants.

If the Education Deduction is to be calculated, the amount in ideduc is simply transferred to the Modeled Education Deduction (imeduc). This amount is also added to imdedfn (Modeled Deductions from Net Income) and subsequently subtracted from iminet (Modeled Net Income). imdedfn and iminet may be later adjusted in the function txhstr to reflect any transfers of the Education Deduction between spouses.

If the education expenses are treated as a tax credit (EDUCOPT=2), the SPSM must first derive the number of months of attendance implied by the value ideduc. This is calculated by dividing ideduc by 50, the number of dollars per month allowed for the Education Deduction in 1984 and rounding the result to the nearest whole month. The Education Tax Credit (imedtxc) is then calculated as the number of months multiplied by the Education Tax Credit per Month (EDTXPM). The function txcalc may transfer unused amounts of the tax credit to a parent or spouse.

Capital Gains Deduction

Since 1985, a deduction has been allowed on behalf of capital gains income. The Capital Gains Deduction is being phased in with an increasing annual deduction limit amounting to \$10,000 in 1985 and \$25,000 in 1986. The amount an individual may claim during his or her lifetime is limited to a fixed amount. These measures were introduced in the May, 1985 Budget Papers and subsequently modified in the June, 1987 White Paper on Tax Reform.

SPSM Implementation

The Capital Gains Deduction is calculated as the minimum of:

- a) the Annual Capital Gains Deduction Limit (The Annual Limit based on gross Capital Gains, CAPGAL, times the Capital Gains Inclusion Rate, CAPGIR, and
- b) Taxable Capital Gains (imicapgt) minus:
 - Allowable Business Investment Loss (idcross)
 - Net Capital Losses of Other Years (imiloss)

The resultant deduction is added to Total Deductions from Net Income (imdedfn).

The database contains no information on the filer's previous Capital Gains Deduction and therefore, the lifetime limit cannot be applied.

Unemployment Insurance Benefit Repayment Payable

If an individual has received Unemployment Insurance Benefits and his or her Net Income exceeds a fixed amount (\$38,610 in 1986), a portion of the benefits must be repaid. This repayment is added to Federal Taxes Payable. The amount repaid becomes a deduction from Net Income.

SPSM Implementation

The amount repayable is a proportion (UIBRP) of the UI Benefits received (imiuib) or a proportion of Net Income exceeding the Repayment Level (UIBRA) whichever is less. The Repayment Amount (imuibr) is a proportion (UIBRP) of the lesser of:

- (a) imiuib: Modeled UI Benefits
- (b) iminet UIBRA: the amount by which Net Income exceeds the Repayment Level

The value of imuibr is added into the variable imrepay which accumulates modeled repayment amounts. imrepay is added to Total Deductions from Net Income (imdedfn).

Family Allowance and OAS Repayments

The SPSM includes optional algorithms which allow the analysis of certain modifications to Family Allowances and the Old Age Supplement. These algorithms are presented with the SPSD/M for illustrating a glass box application. Users may consult the *Programmer's Guide* for further details.

The Family Allowance Repayment is calculated if the parameter FARR (Family Allowance Repayment Rate) is non-zero. The repayment is calculated as the lesser of:

- a) a proportion (FARR) of family net income (the net income of the head plus the net income of the spouse) exceeding the Family Allowance Reduction Level (FATD), and
- b) Taxable Family Allowances Received (imtfa).

The OAS repayment is based on the filer's own Net Income and is computed as the lesser of:

- a) OAS Received (imioas), and
- b) a proportion (OASRR) of Net Income (iminet) exceeding the OAS Repayment Reduction Level (OASTD).

Neither the FA nor the OAS repayments are stored in separate variables. They are accumulated into the variable imrepay which is applied as a deduction from Net Income in the function txitax and is added to Taxes Payable in the function memo1.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ADDDDEDFLAG	Database variable(added) activation flag
AOPT	Age exemption/credit option [1=deduction,2=credit]
AXM	Age amount
AXPI	Age amount phase in rate for 1994 and beyond
AXRR	Age amount credit reduction rate
AXTD	Age amount net income turndown
BXM	Basic personal exemption/amount
CAPGFLAG	Capital gains deduction flag
CAPGIR	Capital gains inclusion rate

CGIFLAG	Capital gains inclusion in interest income deduction flag
CHATL1	Charitable donations amount level 1
CHATNF	Charitable donations maximum net income fraction
CHATR1	Charitable donations tax credit rate 1
CHATR2	Charitable donations tax credit rate 2
DISOPT	Disability deduction/credit option [1=deduction,2=credit]
EDUCOPT	Education deduction/credit option [1=deduction,2=credit]
EDXPM	Education amount per month
EMPLOFLAG	Database variable(emplo) activation flag
FNTCR	Federal non-refundable tax credit rate
FORAVGFLAG	Database variable(foravg) activation flag
MAXDX	Maximum disability deduction/amount
MDCROPT	Medical and charitable deduction/credit option [1=deduction,2=credit]
MEDALL	Medical allowance maximum lower limit
MEDANF	Medical allowance lower limit net income fraction
NORTHFLAG	Database variable(north) activation flag
PARTLOFLAG	Database variable(partlo) activation flag
PEROPT	Personal exemption/credit option [1=deduction,2=credit]
REPNETFLAG	Social program repayments reduce net income flag
STDED	Standard deduction from net income
YINDL	Maximum interest and dividend income deduction
YPNDL	Maximum pension income deduction/amount
YPNOPT	Pension income deduction/credit option [1=deduction,2=credit]

INPUT VARIABLES:

hhnin	Number of individuals in household
idadded	Additional deductions from net income (256)
idage	Age
idcapgx	Capital gains exemptions (254)
idcarry	Carrying charges (221)
idcharit	Charitable donations (340)
idcross	Allowable other years capital loss (253)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idemplo	Employee home relocation loan dedn (248)
idforavg	Forward averaging amount withdrawal (237)
idgifts	Gifts to Canada/provinces/culture (342)
idiint	Interest income (121)
idipens	Pension income (115)
idmedgro	Medical expenses, gross (330)
idnclos	Allowable other years non-capital loss (252)
idnorth	Northern deductions (255)
idothpe	Other dependant exemptions (305)
idpartlo	Limited partnership losses (251)
idstkded	Stock option deduction (249)
imicapgt	Capital gains (taxable)
imidivt	Dividend income (taxable)
iminet	Net income
imninc	No income flag
imrepay	Social Benefits Repayments

OUTPUT VARIABLES:

imatxc	Age tax credit
imaxm	Age personal exemption

imbtc	Basic personal tax credit
imcappgex	Modelled capital gains deduction (254)
imchara	Allowable charitable donations and gifts (calculated)
imchartc	Charitable donations tax credit
imdedfn	All deductions from net income
imdisatc	Disability tax credit
imdisex	Disability exemption
imedtxc	Education allowance tax credit
imeduc	Education allowance for student (322)
imexm	Personal exemptions (Basic+Age)
imintdn	Interest income deduction allowed
imitax	Taxable income
immeda	Medical expenses allowed (computed)
immedatc	Medical expenses allowed tax credit
imothpe	Other dependant tax credit (306)
impendn	Pension income deduction allowed
impentxc	Pension income tax credit
impex	All personal exemptions and deductions
imstddn	Standard or medical+charitable allowed
imstkded	Modelled Stock option deduction (249)

txman Compute provincial taxes for Manitoba

SUMMARY

When MTXFLG is turned off, Manitoba Basic Provincial Tax (imbpt) is calculated as a proportion (MPTF) of Basic Federal Tax (imbft).

The method which the Manitoba Surtax is calculated depends on MNSUROPT. When it is equal to 1, the surtax is calculated as a proportion (MSTR) of Basic Provincial Tax (imbpt) exceeding the Manitoba Surtax Level (MSTC). When MNSUROPT is equal to 2, the surtax is calculated based on a series of family credits. The surtax is added to Basic Provincial Tax to derive Manitoba Tax (imtxp).

When the tax on taxable income flag is turned on (MTXFLG), a provincial tax table (MPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (MPNTPCR) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(MBXM)
impatxc	Age amount tax credit	(MAXM, MAXRR, MAXTD, MAXPI)
impmartc	Married and equivalent-to-married tax credit	(MMXM, MMXMT, MEMXM, MEMXMT)
impcgtc	Caregiver tax credit	(MCGTC, MCGTCFLG,

		MCGTCTC, MCGTCTD, MCGTCTK)
impchrctc	Charitable donations	(MCHATL1, MCHATR1, MCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(MMAXDX)
impdtxc	Dividend tax credit	(MDTCR)
impdtxc	Education tax credit	(MEDXPM, MMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(MYPNDL)
imptutxc	Tuition Tax credit	(MMAXET)
impuictc	EI contributions tax credit	

The option to apply a minimum tax is controlled using MAMTOPT.

The parameter MNRDOPT determines the method used for the Manitoba Tax Reduction.

In 1982, Manitoba applied a method of tax reduction which was based on the Federal Tax Reduction. This method is applied if MNRDOPT is set to 1. The maximum tax reduction was a proportion (MPTF) of the Federal Tax Reduction (imftr). This was reduced by a proportion (MTRF) of Taxable Income (imitax) exceeding the cutoff level (manb) . The cutoff level was derived by looking up the Federal Tax Reduction (imftr) in the Manitoba Tax Reduction Table (MANRD) using the interpolating lookup function lkup1.

If MNRDOPT is set to 2 the Manitoba Tax Reduction (mantr) is calculated as a fixed amount (MTRBR) reduced by a proportion of Taxable Income (imitax).

The Manitoba Tax Reduction (mantr) is subtracted from Manitoba Tax to derive Provincial Tax Payable.

The refundable learning tax credit (immanltc) is equal to MANLTCF times (the tuition amount (idtuin) plus the education amount (imeduc * EDXPM) plus the education amounts transferred from a spouse or kids (imedrcv) minus the education amounts which have been transferred to a spouse or parents (imedtrf)). It is included in the refundable tax credits (imptc). In 1998, the credit is limited to MANLTMAX for each student.

The Manitoba labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The Manitoba provincial credit is modelled as MLVCRT times the gross amount up to MLVCMAX. The credit cannot be more than provincial taxes (imtxp).

The Manitoba homeowner's school tax assistance was introduced in 1993 and is part of the total property tax credit (impptxtc). MSCHFLAG turns it on or off. In order to qualify for assistance, Manitoba residents must be homeowners and be older than MSCHAGE. The basic credit is MSCHBXM which is reduced by income over the turndown MSCHTD by a

rate MSCHRR. The value of the benefit is also rounded (see MSCHRND). The benefit may not exceed school taxes paid (idmschpd) less the minimum threshold of MSCHMNTH. The school tax assistance is added to the basic property tax credit and applied against occupancy costs in order to derive the total property tax credit (impptxtc).

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
EDXPM	Education amount per month
MAMTOPT	Man. alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
MAMTPCTF	Man. amt rate as pct of additional fed tax due to minimum tax
MAMTTX	Man. amt rate as tax on adjusted income
MANLTCF	Manitoba learning tax credit factor
MANLTMAX	Manitoba learning tax credit maximum amount per student
MANRD	Manitoba tax reduction table (MNRDOPT=1) [federal reduction, net income]
MAXM	Man. Age Amount
MAXPI	Man. Age Amount phase in rate for 1994 and beyond
MAXRR	Man. Age Amount credit reduction rate
MAXTD	Man. Age Amount net income turndown
MBXM	Man. Basic Personal Exemption/amount
MCAXM	Manitoba cost-of-living age credit
MCBCR	Manitoba cost-of-living basic credit rate
MCBXM	Manitoba cost-of-living basic credit
MCDISEX	Manitoba cost-of-living disability credit
MCEMXM	Manitoba cost-of-living married equivalent credit
MCFINCR	Manitoba cost-of-living family income reduction rate
MCGTC	Man. Caregiver Tax Credit
MCGTCFLG	Man. Caregiver Tax Credit activation flag
MCGTCTC	Man. Caregiver tax credit take-up rate by age of elderly [age,rate]
MCGTCTD	Man. Caregiver Tax Credit Turn Down Income
MCGTCTK	Man. Caregiver tax credit take-up rate by income level [employment income,rate]
MCHATL1	Man. Charitable Donations amount level 1
MCHATR1	Man. Charitable Donations tax credit rate 1
MCHATR2	Man. Charitable Donations tax credit rate 2
MCMXM	Manitoba cost-of-living married credit
MCDISEX	Manitoba cost-of-living old disabled dependant credit
MCOLOPT	Manitoba cost-of-living tax credit calculation option
MCSAXM	Manitoba cost-of-living spouse age credit
MCSDISEX	Manitoba cost-of-living spouse disabled credit
MCYXXM	Manitoba cost-of-living young dependants credit
MDTCR	Man. dividend tax credit rate
MEDXPM	Man. Education Amount per month
MEMXM	Man. equivalent to married amount
MEMXMT	Man. equivalent to married turndown level

MHMASOPT	Manitoba homeowner assistance option (1=Model 2=database)
MLVCMAX	Maximum Man. labour-sponsored funds tax credit allowed
MLVCRT	Percent of Man. labour-sponsored funds cost allowed as credit
MMAXDX	Man. Maximum Disability deduction/amount
MMAXET	Man. maximum on transfer of education and tuition amount
MMXM	Man. married amount
MMXMT	Man. married amount turndown level
MNITR	Manitoba net income tax rate
MNRDOPT	Manitoba tax reduction calculation option
MNSUROPT	Manitoba surtax calculation option
MPAXM	Manitoba property tax credit senior citizen credit
MPBXM	Manitoba property tax credit basic credit
MPFINCR	Manitoba property tax credit family income reduction rate
MPMINC	Manitoba property tax credit minimum credit
MPMNTH	Manitoba property tax minimum threshold
MPNTR	Man. provincial non-refundable tax credit rate
MPRIR	Manitoba property tax credit rental inclusion rate
MPTC	Manitoba political contribution table [total donations, donation allowed]
MPTCBEN	Maximum Manitoba political tax credit allowed
MPTF	Manitoba provincial tax fraction
MPTX	Man. tax table [taxable income, basic provincial tax]
MRAXM	Manitoba tax reduction age credit
MRBXM	Manitoba tax reduction basic credit
MRDISEX	Manitoba tax reduction disability credit
MREMXM	Manitoba tax reduction married equivalent credit
MRMXM	Manitoba tax reduction married credit
MRODISEX	Manitoba tax reduction old disabled dependant credit
MRSAXM	Manitoba tax reduction spouse age credit
MRYCXM	Manitoba tax reduction young dependants credit
MSAXM	Manitoba surtax age credit
MSBXM	Manitoba surtax basic credit
MSCHAGE	Manitoba school tax minimum age
MSCHBXM	Manitoba school tax basic amount
MSCHFLAG	Manitoba school tax assistance activation flag
MSCHMNTH	Manitoba school tax minimum threshold
MSCHRND	Manitoba school tax assistance rounding unit
MSCHRR	Manitoba school tax reduction rate
MSCHTD	Manitoba school tax turndown
MSDISEX	Manitoba surtax disability credit
MSEMXM	Manitoba surtax married equivalent credit
MSMXM	Manitoba surtax married credit
MSODISEX	Manitoba surtax old disabled dependant credit
MSSAXM	Manitoba surtax spouse age credit
MSTC	Manitoba surtax cut-in
MSTR	Manitoba surtax rate
MSYCXM	Manitoba surtax young dependants credit
MTCINCF	Manitoba tax credit income definition flag
MTRBR	Manitoba tax reduction basic amount
MTRF	Manitoba tax reduction fraction
MTRNIO	Manitoba tax reduction net income offset
MTRSF	Manitoba tax reduction spousal factor
MTXFLG	Man. tax on taxable income activation flag
MYPNDL	Man. Pension Income Deduction Amount

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hdtenur	Tenure
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
idhomstu	College res/resdnt homeowner assist (558)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]
idipens	Pension income (115)
idlabtvg	Gross Labour funds bought (413)
idmschpd	Manitoba school taxes paid
idothpe	Other dependant exemptions (305)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)
idrand	Random numbers [array]
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imatxc	Age tax credit
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts (calculated)
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepni	Dependant's net income
imdisex	Disability exemption
imedrcv	Education and tuition transferred from others
imedtrf	Education and tuition transferred to others
imeduc	Education allowance for student (322)
imftr	Federal tax reduction
imftrt	Federal tax reduction transferred from spouse
imidivt	Dividend income (taxable)
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
immartxc	Married tax credit claimed

immeda	Medical expenses allowed (computed)
imnfach	Number of family allowance children claimed
impex	All personal exemptions and deductions
improptx	Imputed property tax paid
imrentpd	Imputed rent paid
imstxcrt	Tax credits transfered from spouse
imuic	UIC contributions
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
immanltc	Manitoba learning tax credit
immhmas	Manitoba Homeowners Assistance
imnptc	Non-refundable provincial tax credits
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgctc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transfered from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
impnit	Provincial net income tax
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
impptxtc	Provincial Property tax tax credit
imprvtax	Prov gross provincial tax
impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
impptxct	Prov total tax credits transfered
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

txnb Compute provincial taxes for New Brunswick

SUMMARY

When BTXFLG is turned off, the basic Provincial Tax (imbpt) for New Brunswick is simply

a proportion (BPTF) of Basic Federal Tax (imbft).

The 2000 budget announced that New Brunswick would convert to a tax on taxable income starting in 2000. When the tax on taxable income flag is turned on (BTXFLG), a provincial tax table (BPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (BPNTCR) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(BBXM)
impatxc	Age amount tax credit	(BAXM, BAXRR, BAXTD, BAXPI)
impmartc	Married and equivalent-to-married tax credit	(BMXM, BMXMT, BEMXM, BEMXMT)
impcgtc	Caregiver tax credit	(BCGTC, BCGTCFLG, BCGTCTC, BCGTCTD, BCGTCTK)
impchrctc	Charitable donations	(BCHATL1, BCHATR1, BCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(BMAXDX)
impdtxc	Dividend tax credit	(BDTCR)
impedtxc	Education tax credit	(BEDXPM, BMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(BYPNDL)
imptutxc	Tuition Tax credit	(BMAXET)
impuictc	EI contributions tax credit	

The option to apply a minimum tax is controlled using BAMTOPT.

The New Brunswick labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The New Brunswick provincial credit is modeled as BLVCRT times the gross amount up to BLVCMAX. The credit cannot be more than provincial taxes (imtxp).

Child Tax Benefit

When NBCTBFLG is assigned a value of 1, the New Brunswick Child Tax Benefit calculation is activated. imnbcben is the total benefits received under the New Brunswick Child Benefits program announced in the 1997 New Brunswick Budget and commencing in April 1997. A first component is the base amount, imnbcbb, which is calculated as the base amount per child, NBCBBAS, times the number of children. The level of benefit is reduced, based on family income, at a rate NBCBRRS for families with only one child, and at rate

NBCBRR for the others.

If the family gross employment income is higher than a threshold, NBCBECI, then the maximum supplement is NBCBEIS. The supplement is reduced at a rate NBCBESR for each \$ of employment income exceeding the threshold FCBECI. If the family income is higher than NBCBETD then the supplement is reduce at a rate NBCBERR. The final value of the work income supplement is stored in imnbwis.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BAMTOPT	N.B. alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
BAMTPCTF	N.B. amt rate as pct of additional fed tax due to minimum tax
BAMTTX	N.B. amt rate as tax on adjusted income
BAXM	N.B. Age Amount
BAXPI	N.B. Age Amount phase in rate for 1994 and beyond
BAXRR	N.B. Age Amount credit reduction rate
BAXTD	N.B. Age Amount net income turndown
BBXM	N.B. Basic Personal Exemption/amount
BCGTC	N.B. Caregiver Tax Credit
BCGTCFLG	N.B. Caregiver Tax Credit activation flag
BCGTCTC	N.B. Caregiver tax credit take-up rate by age of elderly [age,rate]
BCGTCTD	N.B. Caregiver Tax Credit Turn Down Income
BCGTCTK	N.B. Caregiver tax credit take-up rate by income level [employment income,rate]
BCHATL1	N.B. Charitable Donations amount level 1
BCHATR1	N.B. Charitable Donations tax credit rate 1
BCHATR2	N.B. Charitable Donations tax credit rate 2
BDCR	N.B. dividend tax credit rate
BEDXPM	N.B. Education Amount per month
BEMXM	N.B. equivalent to married amount
BEMXMT	N.B. equivalent to married turndown level
BLVCMAX	Maximum N.B. labour-sponsored funds tax credit allowed
BLVCRT	Percent of N.B. labour-sponsored funds cost allowed as credit
BMAXDX	N.B. Maximum Disability deduction/amount
BMAXET	N.B. maximum on transfer of education and tuition amount
BMXM	N.B. married amount
BMXMT	N.B. married amount turndown level
BPNTCR	N.B. provincial non-refundable tax credit rate
BPTC	New Brunsw. political contribution table [total donations,donation allowed]
BPTCBEN	Maximum New Brunswick political tax credit allowed

BPTF	New Brunswick provincial tax fraction
BPTX	N.B. tax table [taxable income,basic provincial tax]
BSCI	New Brunswick provincial tax above which surtax applies
BSF	New Brunswick provincial surtax rate
BTXFLG	N.B. tax on taxable income activation flag
BYPNDL	N.B. Pension Income Deduction Amount
CTCINC	CTC family income scaling factor
NBCBBAS	NB Basic child benefit (per child)
NBCBECI	NB Child benefits earning supplement cut-in level
NBCBEIS	NB Child benefits earned income supplement
NBCBERR	NB Child benefits earning supplement reduction rate
NBCBESR	NB Child benefits earned income supplement rate
NBCBETD	NB Child benefits earning supplement turndown level
NBCBPI	NB Child benefits phase-in rate
NBCBRR	NB Multi-children family income reduction rate
NBCBRRS	NB Single-child family income reduction rate
NBCBTD	NB child benefits family income turndown
NBCTBFLG	NB child benefit activation flag
PYINC	Deflator to calculate previous year income

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idlabtxg	Gross Labour funds bought (413)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpcl	Provincial political contributions (565)
idrand	Random numbers [array]
idsex	Sex
idtuitn	Tuition fees (320)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts (calculated)

imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepmi	Dependant's net income
imidivt	Dividend income (taxable)
iminet	Net income
imisa	Social assistance (or replacement program)
imitax	Taxable income
immeda	Medical expenses allowed (computed)
imuic	UIC contributions
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfnspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imnbcbb	NB child tax Benefits base amount
imnbcben	Total NB child tax Benefits
imnbwis	NB child tax Benefits WIS
imninc	No income flag
imnptc	Non-refundable provincial tax credits
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgtc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transferred from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
imprvtax	Prov gross provincial tax
impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
impttxct	Prov total tax credits transferred
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

txnfld Compute provincial taxes for Newfoundland

SUMMARY

When NTXFLG is turned off, Basic Provincial Tax (imbpt) for Newfoundland is simply a

proportion (NPTF) of Basic Federal Tax (imbft).

For Newfoundland, the SPSM calculates provincial surtax (impsur) as NSF percent of provincial taxes (imtxp) above the level NSCI.

The 2000 budget stated that Newfoundland would convert to a tax on taxable income starting in 2001. When the tax on taxable income flag is turned on (NTXFLG), a provincial tax table (NPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (NPNTCR) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(NBXM)
impatxc	Age amount tax credit	(NAXM, NAXRR, NAXTD, NAXPI)
impmartc	Married and equivalent-to-married tax credit	(NMXM, NMXMT, NEMXM, NEMXMT)
impcgtc	Caregiver tax credit	(NCGTC, NCGTCFLG, NCGTCTC, NCGTCTD, NCGTCTK)
impchrctc	Charitable donations	(NCHATL1, NCHATR1, NCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(NMAXDX)
impdtxc	Dividend tax credit	(NDTCR)
impedtxc	Education tax credit	(NEDXPM, NMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(NYPNDL)
imptutxc	Tuition Tax credit	(NMAXET)
impuictc	EI contributions tax credit	

The option to apply a minimum tax is controlled using NAMTOPT.

A new refundable sales tax credit was modeled and added to the provincial tax credit (imptc). Similar to the federal credit, it allows for NSTCA dollars for each adult, NSTCC dollars for each child, and it reduced starting at family incomes over NSTCL at a rate of NSTCR.

Newfoundland and Labrador Child Benefit

Program Description

The child benefit was introduced in the 1998 provincial budget. The Newfoundland and Labrador Child Benefit (imncb) is a tax-free monthly payment to help low-income families with the cost of raising children under age 18. Benefits from this program are combined with the Canada Child Tax Benefit into a single monthly payment. The program was implemented in July 1999.

SPSM Implementation

This benefit is turned by NCBFLG. Under the Newfoundland and Labrador Child Benefit program, you may be entitled to receive a benefit of NCB1 for the first child, NCB2 for the second child, NCB3 for the third child, and NCB4 for each additional child. The benefit is reduced when net family income is greater than NCBTD and is completely phased out when net family income is at least NCBPO. The benefit (imncb) is assigned to the mother if present.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTCIFLAG	Refundable tax credits social assistance income inclusion flag
CTCINC	CTC family income scaling factor
NAMTOPT	NFLD alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
NAMTPCTF	NFLD amt rate as pct of additional fed tax due to minimum tax
NAMTTX	NFLD amt rate as tax on adjusted income
NAXM	NFLD Age Amount
NAXPI	NFLD Age Amount phase in rate for 1994 and beyond
NAXRR	NFLD Age Amount credit reduction rate
NAXTD	NFLD Age Amount net income turndown
NBXM	NFLD Basic Personal Exemption/amount
NCB1	Nfld. child benefit for first child
NCB2	Nfld. child benefit for second child
NCB3	Nfld. child benefit for third child
NCB4	Nfld. child benefit for 4th and subsequent child
NCBFLG	Newfoundland child benefit activation flag
NCBPI	Nfld. child benefit program phase in
NCBPO	Nfld. child benefit family income phase out
NCBTD	Nfld. child benefit family income turndown
NCGTC	NFLD Caregiver Tax Credit
NCGTCFLG	NFLD Caregiver Tax Credit activation flag
NCGTCTC	NFLD Caregiver tax credit take-up rate by age of elderly [age,rate]
NCGTCTD	NFLD Caregiver Tax Credit Turn Down Income
NCGTCTK	NFLD Caregiver tax credit take-up rate by income level [employment income,rate]
NCHATL1	NFLD Charitable Donations amount level 1
NCHATR1	NFLD Charitable Donations tax credit rate 1
NCHATR2	NFLD Charitable Donations tax credit rate 2
NDTCR	NFLD dividend tax credit rate
NEDXPM	NFLD Education Amount per month
NEMXM	NFLD equivalent to married amount
NEMXMT	NFLD equivalent to married turndown level

NMAXDX	NFLD Maximum Disability deduction/amount
NMAXET	NFLD maximum on transfer of education and tuition amount
NMXM	NFLD married amount
NMXMT	NFLD married amount turndown level
NPNTCR	NFLD provincial non-refundable tax credit rate
NPTC	Newfoundland political contribution table [total donations, donation allowed]
NPTCBEN	Maximum Newfoundland political tax credit allowed
NPTF	Newfoundland provincial tax fraction
NPTX	NFLD tax table [taxable income, basic provincial tax]
NSCI	Newfoundland provincial tax above which surtax applies
NSF	Newfoundland provincial surtax rate
NSTCA	NFLD sales tax credit amount for adults
NSTCC	NFLD sales tax credit amount for children
NSTCFLAG	NFLD sales tax credit activation flag
NSTCL	NFLD sales tax credit reduction level
NSTCR	NFLD sales tax credit reduction rate
NTCMAX	Newfoundland maximum stock and venture tax credit
NTXFLG	NFLD tax on taxable income activation flag
NYPNDL	NFLD Pension Income Deduction Amount
PYINC	Deflator to calculate previous year income

INPUT VARIABLES:

cfageeld	Age of eldest in census family
cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfinel	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idipens	Pension income (115)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idrand	Random numbers [array]
idsex	Sex
idtuitn	Tuition fees (320)
idvencap	Venture capital tax credit (564)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax

imchara	Allowable charitable donations and gifts (calculated)
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepni	Dependant's net income
imidivt	Dividend income (taxable)
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
immeda	Medical expenses allowed (computed)
imuic	UIC contributions
nfineld	Eldest person in nuclear family [pointer]
nfnspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfnspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imncb	Newfoundland Child Benefit
imninc	No income flag
imnpctc	Non-refundable provincial tax credits
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgfc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpctc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transfered from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
imprvtax	Prov gross provincial tax
impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptc	Refundable provincial tax credits
impttxct	Prov total tax credits transfered
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

SUMMARY

This function calculates provincial taxes and credits for Nova Scotia. The programs simulated are as follows:

- Basic provincial tax
- Two level surtax
- Family tax reduction
- Pharmacare tax and tax credits
- Provincial foreign tax credit
- Provincial political tax credit
- Provincial labour-sponsored venture capital tax credit
- Stock savings plan tax credit
- Home ownership savings plan tax credit
- Direct Assistance

Basic Provincial Tax

When VTXFLG is turned off, the algorithm first calculates basic provincial tax. Basic provincial tax (imbpt) for Nova Scotia is calculated as a proportion (VPTF) of Basic Federal Tax (imbft). Provincial taxes payable (imtxp) are then initialized to the value of basic provincial tax (imbpt).

The 2000 budget announced that Nova Scotia would convert to a tax on taxable income starting in 2000. When the tax on taxable income flag is turned on (VTXFLG), a provincial tax table (VPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (VPNTPCR) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(VBXM)
impatxc	Age amount tax credit	(VAXM, VAXRR, VAXTD, VAXPI)
impmartc	Married and equivalent-to-married tax credit	(VMXM, VMXMT, VEMXM, VEMXMT)
impcgctc	Caregiver tax credit	(VCGTC, VCGTCFLG, VCGTCTC, VCGTCTD, VCGTCTK)
impchrctc	Charitable donations	(VCHATL1, VCHATR1, VCHATR2)
impcpctc	CPP/QPP contribution	
impdistc	Disability tax credit	(VMAXDX)
impdctc	Dividend tax credit	(VDTCR)

impedtxc	Education tax credit	(VEDXPM, VMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(VYPNDL)
imptutxc	Tuition Tax credit	(VMAXET)
impuictc	EI contributions tax credit	

The option to apply a minimum tax is controlled using VAMTOPT.

Provincial Surtax

The Nova Scotia surtax (impsur) is calculated as VSF percent of provincial taxes (imtxp) above the level VSCI plus VSF2 percent of provincial taxes above the level VSCI2. This amount is then added to provincial taxes payable (imtxp).

Family Tax Reduction

Program Description

The Nova Scotia tax reduction for low income individuals and families was introduced in 1994. To be eligible for the reduction a filer must be either over age 18, or have a spouse, or be a parent. This a family based tax reduction and only one person of a married couple may claim the reduction. The reduction has prescribed maximum amounts for the claimant, a spouse and children. There is an equivalent to married amount in cases where a claimant has filed for the federal equivalent to married non-refundable tax credit. The total of these amounts is then subject to a family income test.

SPSM Implementation

The calculation closely follows the structure on form T1C (N.S.). Individuals are first tested for eligibility on the basis of age (idage), marital status (idspoflg), and parental status. Parental status is only relevant for young (<19) families and single parents and so is tested using relation to head (idcfrh == 0) and presence of young children (nfnkids).

Persons without a spouse are assigned the basic amount (VTRBAS). Heads of census families with a spouse are assigned the basic and spouse amounts (VTRBAS + VTRSP). Equivalent to married amounts (VTREM) are given to spouseless heads who claim the federal married tax credit (immartxc). Amounts for children are given to the head of the census family. No child amounts are given with respect to children who triggered the equivalent to married amount.

The maximum deduction is then reduced by a fixed proportion (VTRRR) of the net income (iminet) of the head plus spouse (if present) in excess of the income base amount (VTRTD). This calculation is performed for persons without spouses or heads of census families with spouses. The amounts for families with spouses are then assigned to the spouse with the higher net income. The tax reduction thus calculated is written to the non-refundable provincial tax reduction variable (imptr) and is used to decrease provincial taxes payable (imtxp).

Pharmacare Program

Program Description

Introduced in the 1995 provincial budget, the pharmacare program consists of an annual pharmacare premium payable by all seniors and a refundable tax credit for low income seniors.

SPSM Implementation

The pharmacare premium (VPHPREM) is assigned to the variable impeht for all Nova Scotians age 65 or older. This amount is then used to increase provincial taxes payable (imtxp).

The pharmacare refundable tax credit (impehtc) is calculated for all Nova Scotia seniors in receipt of GIS benefits (imigis). It is calculated as the basic tax credit (VPHTC) less a fixed proportion (VPHRR) of income (imgisinc) above a threshold (VPHTD). The pharmacare refundable tax credit (impehtc) is added to the variable for refundable provincial tax credits (imptc).

Starting in 1996, the tax credit no longer depended on whether or not a person received GIS. Instead, the credit is taxed back depending on family income. When VPHOPT is set to 1, the program depends on GIS receipt, and when it is set to 2 it depends on family income. There are now two turndowns, VPHTD for singles (also used in the original program) and VPHTDC for couples.

Provincial Foreign Tax Credit

The provincial foreign tax credit is imputed from the Greenbook (idprvftc). Only the amount of the foreign tax credit required to reduce provincial tax payable (imtxp) to zero is applied to the variable for non-refundable provincial tax credits (imnptc). Provincial tax payable (imtxp) is then reduced by the amount imnptc.

Political Contribution Tax Credit

Labour Sponsored Venture Capital Tax Credit

The Nova Scotia labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The Nova Scotia provincial credit is modeled as VLVCRT times the gross amount up to VLVCMAX. The credit cannot be more than provincial taxes (imtxp).

Direct Assistance

Program Description

Introduced in the 1997 provincial budget, direct assistance gives a benefit to low income Nova Scotians who would not be otherwise eligible for the tax reduction.

Beginning in 2000, direct assistance is only granted to families with children.

SPSM Implementation

Nova Scotia residents 19 and over are eligible for direct assistance if their income is below the cut-off (VDACI for families or VDASI for single individuals). The benefits are VDACB for families and VDASB for single individuals.

Differences between the SPSM estimate and reality will primarily come from two problems. Persons are eligible for Direct Assistance if they were full time students for 4 months or less or if they received Social Assistance for three months or less. In the SPSM model, anyone who is a full-time student in March (idestat==1) or anyone who receives Social Assistance was deemed ineligible for the program. This should lower estimates. But since people have to apply for the program, the take-up is probably not going to be 100% which will increase the SPSM estimate.

Nova Scotia Child Benefit

Program Description

The child benefit was introduced in the 1998 provincial budget.

SPSM Implementation

The benefit is turned on by the flag VCBFLG, and families whose net income is less than VCBTD are eligible. They receive VCBBAS1 for their first child, VCBBAS2 for their second child, and VCBBAS3 for their third and each additional child. The benefit is completely phased out when the family net income reaches VCBPO. The benefit (imnscb) is assigned to the mother if present.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTCINC	CTC family income scaling factor
PYINC	Deflator to calculate previous year income
VAMTOPT	N.S. alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
VAMTPCTF	N.S. amt rate as pct of additional fed tax due to minimum tax
VAMTTX	N.S. amt rate as tax on adjusted income
VAXM	N.S. Age Amount

VAXPI	N.S. Age Amount phase in rate for 1994 and beyond
VAXRR	N.S. Age Amount credit reduction rate
VAXTD	N.S. Age Amount net income turndown
VBXM	N.S. Basic Personal Exemption/amount
VCBBAS1	NS child benefit for first child
VCBBAS2	NS child benefit for second child
VCBBAS3	NS child benefit for third or additional child
VCBFLG	NS child benefit activation flag
VCBPO	NS child benefit family income phase out
VCBTD	NS child benefit turndown
VCGTC	N.S. Caregiver Tax Credit
VCGTCFLG	N.S. Caregiver Tax Credit activation flag
VCGTCTC	N.S. Caregiver tax credit take-up rate by age of elderly [age,rate]
VCGTCTD	N.S. Caregiver Tax Credit Turn Down Income
VCGTCTK	N.S. Caregiver tax credit take-up rate by income level [employment income,rate]
VCHATL1	N.S. Charitable Donations amount level 1
VCHATR1	N.S. Charitable Donations tax credit rate 1
VCHATR2	N.S. Charitable Donations tax credit rate 2
VDACB	NS Direct assistance benefit for couples
VDACI	NS Direct assistance maximum income for couples
VDAFLAG	NS Direct assistance benefit flag
VDAFWC	NS Direct assistance benefit for families with children flag
VDASB	NS Direct assistance benefit for singles
VDASI	NS Direct assistance maximum income for singles
VDTCR	N.S. dividend tax credit rate
VEDXPM	N.S. Education Amount per month
VEMXM	N.S. equivalent to married amount
VEMXMT	N.S. equivalent to married turndown level
VHOSPMAX	Maximum Nova Scotia HOSP contributions per person
VHOSPR	Nova Scotia qualified single parent family income adjustment rate
VHOSPRM	Nova Scotia qualified family income adjustment rate
VHOT	Nova Scotia HOSP credit rate [net income, tax credit rate]
VHOTM	Nova Scotia HOSP credit rate: Married [family net income, tax credit rate]
VLVCMAX	Maximum N.S. labour-sponsored funds tax credit allowed
VLVCRT	Percent of N.S. labour-sponsored funds cost allowed as credit
VMAXDX	N.S. Maximum Disability deduction/amount
VMAXET	N.S. maximum on transfer of education and tuition amount
VMXM	N.S. married amount
VMXMT	N.S. married amount turndown level
VPHOPT	Nova Scotia pharmacare premium option (1=GIS, 2=income)
VPHPREM	Nova Scotia pharmacare premium
VPHRR	Nova Scotia pharmacare tax credit reduction rate
VPHTC	Nova Scotia pharmacare refundable tax credit
VPHTD	Nova Scotia pharmacare tax credit turndown
VPHTDC	Nova Scotia pharmacare tax credit turndown for couples
VPNTCR	N.S. provincial non-refundable tax credit rate
VPTC	Nova Scotia political contribution table [total donations,donation allowed]
VPTCBEN	Maximum Nova Scotia political tax credit allowed
VPTF	Nova Scotia provincial tax fraction
VPTX	N.S. tax table [taxable income,basic provincial tax]

VSCI	Nova Scotia provincial tax above which surtax applies
VSCI2	Nova Scotia provincial tax above which surtax applies (2nd level)
VSF	Nova Scotia provincial surtax rate
VSF2	Nova Scotia provincial surtax rate (2nd level)
VTRBAS	Nova Scotia tax reduction basic amount
VTREM	Nova Scotia tax reduction equivalent to spouse amount
VTRKID	Nova Scotia tax reduction child amount
VTRRR	Nova Scotia tax reduction family income reduction rate
VTRSP	Nova Scotia tax reduction spouse amount
VTRTD	Nova Scotia tax reduction family income turndown
VTXFLG	N.S. tax on taxable income activation flag
VYPNDL	N.S. Pension Income Deduction Amount

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfinel	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcf	Person's census family [pointer]
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
idestat	Educational status
idhosslf	Hosp. contributions - self (598)
idhospo	Hosp. contributions - spouse (599)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idipens	Pension income (115)
idlabtsg	Gross Labour funds bought (413)
idnf	Person's nuclear family [pointer]
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idrand	Random numbers [array]
idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax
imcemc	Child's equivalent to married credit
imchara	Allowable charitable donations and gifts (calculated)
imcppse	CPP contributions deduction for self-emp

imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepmi	Dependant's net income
imgisinc	Individual's income for GIS/SPA reduction
imidivt	Dividend income (taxable)
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
imitot	Total income
immartxc	Married tax credit claimed
immeda	Medical expenses allowed (computed)
imuic	UIC contributions
nfinch	First child in nuclear family [pointer]
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfnspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

idinspo	Person's spouse [pointer]
imbpt	Basic provincial tax
iminsda	NS Direct Assistance Program
imninc	No income flag
imnptc	Non-refundable provincial tax credits
imnscb	Nova Scotia Child Benefit
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgctc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transferred from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
impeht	Provincial elderly health tax
impehtc	Provincial elderly health tax credit
imphotc	Provincial HOSP tax credits
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
imprvtax	Prov gross provincial tax
impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
impttxct	Prov total tax credits transferred
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

SUMMARY

When OTXFLG is turned off, the Ontario Provincial Tax (imbpt) is calculated as a proportion (OPTF) of Basic Federal Tax (imbft). Added to Basic for some years is the Social Services Maintenance Tax which is a proportion (OSSMR) of Basic Provincial Tax (imbpt) exceeding the tax level (OSSML).

When the tax on taxable income flag is turned on (OTXFLG), a provincial tax table (OPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (OPNTPCR) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(OBXM)
impatxc	Age amount tax credit	(OAXM, OAXRR, OAXTD, OAXPI)
impmartc	Married and equivalent-to-married tax credit	(OMXM, OMXMT, OEMXM, OEMXMT)
impcgtc	Caregiver tax credit	(OCGTC, OCGTCFLG, OCGTCTC, OCGTCTD, OCGTCTK)
impchrctc	Charitable donations	(OCHATL1, OCHATR1, OCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(OMAXDX)
impdtxc	Dividend tax credit	(ODTCR)
impedtxc	Education tax credit	(OEDXPM, OMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(OYPNDL)
imptutxc	Tuition Tax credit	(OMAXET)
impuietc	EI contributions tax credit	

The option to apply a minimum tax is controlled using OAMTOPT.

Ontario provides a tax reduction for persons with a low taxable income. This reduction amounts to a proportion (OTRF) of taxable income (imitax) below the Ontario Tax Reduction Level (OMTY). This is subtracted from Basic Provincial Tax to derive Provincial Tax Payable (imtxp).

The Ontario labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The Ontario provincial credit is modeled as OLVCRRT times the gross amount up to OLVCMAX. The credit cannot be more than provincial taxes (imtxp).

The Employer Health Tax (imonteht) only applies to self-employed persons, and is calculated when OEHTFLAG is set to 1. When a person's income from self-employment is less OEHTTD1, the Employer Health Tax is calculated using the rate OEHTRR1 on self-employment earnings over the exemption OEHTEX. When a person's income from self-employment is less than this value, but greater than OEHTTD1, the Employer Health Tax is calculated by adding OEHTRR1 times the difference between the first turndown (OEHTTD1) and the exemption rate (OEHTEX) and OEHTRR2 times the difference between earnings from self-employment and OEHTTD1. When self-employment earnings are greater than OEHTTD2, the Ontario Employer Health Tax is calculated as OEHTRR3 times earnings from self-employment which are greater than the exemption OEHTEX.

When the parameter OCCEAFLG is set to 1, the child care expense credit is calculated. The maximum amount of the benefit is calculated as the lower of either OCCEAPCT times actual child care expenses (imccea), or of a specified amount per child (OCCEAYNG) times the number of children age 6 and under in the census family. Maximum family benefits are then reduced by a proportion (OCCEARR) of family net income above the threshold (OCCEATD). The model assigns the imputed Child Care credit (imoccea) to the mother, if present.

When OCWISFLG is set to 1, the supplement for working families is calculated as a percentage (OCWISRR) of family income over a threshold OCWISTD. The percentage depends on the number of children under the age of 7 in the family. The Supplement cannot exceed OCCEAYNG times the number of children under the age of 7. In single parent families, the maximum cannot exceed OCWISSP times the number of children under the age of 7 as announced in the Ontario 2000 Budget. The benefit which is given is the maximum value of either the supplement or the childcare expenses credit.

The taxpayer dividend (imotxdv) announced in the 2000 Budget was implemented. It is equal to taxes paid in the previous year up to a maximum (OTXDVMAX). People who paid over 0\$ in taxes would get a minimum rebate of OTXDVMIN. The benefit is included in refundable tax credits of 2000. Since it is based on the previous year's taxes, the taxes are multiplied by OPYTAX in order to estimate the lagged effect.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CAPGFLAG	Capital gains deduction flag
CAPGIR	Capital gains inclusion rate
OAMTOPT	Ont. alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
OAMTPCTF	Ont. amt rate as pct of additional fed tax due to minimum tax
OAMTTX	Ont. amt rate as tax on adjusted income
OAXM	Ont. Age Amount
OAXPI	Ont. Age Amount phase in rate for 1994 and beyond
OAXRR	Ont. Age Amount credit reduction rate
OAXTD	Ont. Age Amount net income turndown
OBXM	Ont. Basic Personal Exemption/amount
OCAPGIR	Ont. Capital Gains Inclusion Rate
OCCEAFLG	Ont. Child Care Expense Credit activation flag
OCCEAPCT	Ont. Child Care Expense Credit qualifying percentage
OCCEARR	Ont. Child Care Expense Credit benefit reduction rate
OCCEATD	Ont. Child Care Expense Credit family income turndown
OCCEAYNG	Ont. Child Care Expense Credit allowance per child
OCGIRFLG	Ont. Capital Gains Inclusion Rate Activation Flag
OCGTC	Ont. Caregiver Tax Credit
OCGTCTFLG	Ont. Caregiver Tax Credit activation flag
OCGTCTC	Ont. Caregiver tax credit take-up rate by age of elderly [age,rate]
OCGTCTD	Ont. Caregiver Tax Credit Turn Down Income
OCGTCTK	Ont. Caregiver tax credit take-up rate by income level [employment income,rate]
OCHATL1	Ont. Charitable Donations amount level 1
OCHATR1	Ont. Charitable Donations tax credit rate 1
OCHATR2	Ont. Charitable Donations tax credit rate 2
OCWISFLG	Ont. Child Care Working Income Supplement activation flag
OCWISRR	Ont. Child Care Working Income Supplement Rate [children][rr]
OCWISSP	Ont. Child Care Working Income Supplement maximum benefit for single parents
OCWISTD	Ont. Child Care Working Income Supplement minimum earnings
ODTCR	Ont. dividend tax credit rate
OEDXPM	Ont. Education Amount per month
OEHTDRR	OEHT - Income Tax Deduction Rate
OEHTEX	OEHT - Exemption
OEHTFLAG	OEHT - Ontario Employer Health Tax Flag
OEHTRR1	OEHT - Rate 1
OEHTRR2	OEHT - Rate 2
OEHTRR3	OEHT - Rate 3
OEHTTD1	OEHT - Turndown 1
OEHTTD2	OEHT - Turndown 2
OEMXM	Ont. equivalent to married amount
OEMXMT	Ont. equivalent to married turndown level

OHCMAX	Ontario maximum individual HOSP contribution
OHIRF	Ontario HOSP family income reduction factor
OHT	Ontario HOSP tax credit factor table
OLVCMAX	Maximum Ont. labour-sponsored funds tax credit allowed
OLVCRT	Percent of Ont. labour-sponsored funds cost allowed as credit
OMAXDX	Ont. Maximum Disability deduction/amount
OMAXET	Ont. maximum on transfer of education and tuition amount
OMTY	Ontario tax reduction limit
OMXM	Ont. married amount
OMXMT	Ont. married amount turndown level
OPCRA	Ontario property tax college residence amount
OPNTCR	Ont. provincial non-refundable tax credit rate
OPOCAR	Ontario property tax percent of occupancy cost
OPOCM	Ontario property tax maximum occupancy cost
OPRIR	Ontario property tax credit rental inclusion rate
OPSIOPT	Ontario property/sales tax credit income concept
OPSMAX	Ontario property/sales tax credit maximum
OPSTITD	Ontario property/sales tax credit income turndown
OPTC	Ontario political contribution table [total donations, donation allowed]
OPTCBEN	Maximum Ontario political tax credit allowed
OPTF	Ontario provincial tax fraction
OPTX	Ont. tax table [taxable income, basic provincial tax]
OPYTAX	Estimate of previous year's Ontario taxes
ORDOPT	Ontario tax reduction calculation option
OSPOCM	Ontario seniors property tax maximum occupancy cost
OSPPE	Ontario sales tax credit % personal exemptions
OSSML	Ontario surtax first cut-in level
OSSML2	Ontario surtax second cut-in level
OSSMR	Ontario surtax first level rate
OSSMR2	Ontario surtax second level rate
OSSTCP	Ontario seniors sales tax credit percent of income
OSTCB	Ontario sales tax credit basic credit
OSTCD	Ontario sales tax credit dependant credit
OSTCFLAG	Ontario seniors tax credit claimed flag
OSTCNIBA	Ontario seniors tax credit net income base amount
OSTCOPT	Ontario sales tax credit calculation option
OSTCP	Ontario sales tax credit percent of income
OSTCS	Ontario sales tax credit spouse credit
OTCNIBA	Ontario tax credit net income base amount
OTRBPA	Ontario tax reduction basic personal amount
OTRDCA	Ontario tax reduction dependant child amount
OTRDDA	Ontario tax reduction disabled dependant amount
OTRF	Ontario tax reduction Ontario tax multiplier
OTRFP	Ontario tax reduction personal amount multiplier
OTXDVMAX	Maximum taxpayer dividend
OTXDVMIN	Minimum taxpayer dividend for people with non-zero taxes
OTXFLG	Ont. tax on taxable income activation flag
OYPNDL	Ont. Pension Income Deduction Amount

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)

cfnkids	Number of children in census family
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
idage	Age
idcapgex	Capital gains exemptions (254)
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
idhomstu	College res/resdnt homeowner assist (558)
idhosslf	Hosp. contributions - self (598)
idhospo	Hosp. contributions - spouse (599)
idicapg	Capital gains (actual)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiloss	Business investment losses (217)
idinspo	Person's spouse [pointer]
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idlabtxg	Gross Labour funds bought (413)
idnf	Person's nuclear family [pointer]
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)
idrand	Random numbers [array]
idsex	Sex
idspoflg	Person has spouse
idstkded	Stock option deduction (249)
idtuitn	Tuition fees (320)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax
imccea	Child care expenses allowed
imchara	Allowable charitable donations and gifts (calculated)
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdedft	Deductions from total income
imdepmi	Dependant's net income
imicapgt	Capital gains (taxable)
imidivt	Dividend income (taxable)
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
imitot	Total income
immarex	Married exemption claimed
immartxc	Married tax credit claimed

immeda	Medical expenses allowed (computed)
imnfach	Number of family allowance children claimed
impex	All personal exemptions and deductions
improptx	Imputed property tax paid
imrentpd	Imputed rent paid
imuic	UIC contributions
nfnkids	Number of children in nuclear family

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imiotax	Ontario taxable income
imninc	No income flag
imnptc	Non-refundable provincial tax credits
imoccea	Ont. Child Care Exp. credit allowed (Family)
imonteht	Ontario Employers Heath Tax (Self-employed)
imotxdv	Ontario Taxpayer Dividend
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgctc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transfered from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
imprvtax	Prov gross provincial tax
impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
impттxct	Prov total tax credits transfered
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

txpei Compute provincial taxes for P.E.I.

SUMMARY

When PTXFLG is off, the Basic Provincial Tax (imbpt) for Prince Edward Island is simply a proportion (PPTF) of Basic Federal Tax (imbft).

The 2000 budget announced that PEI would convert to a tax on taxable income starting in

2001. When the tax on taxable income flag is turned on (PTXFLG), a provincial tax table (PPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (PPNTRC) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(PBXM)
impatxc	Age amount tax credit	(PAXM, PAXRR, PAXTD, PAXPI)
impmartc	Married and equivalent-to-married tax credit	(PMXM, PMXMT, PEMXM, PEMXMT)
impcgtc	Caregiver tax credit	(PCGTC, PCGTCFLG, PCGTCTC, PCGTCTD, PCGTCTK)
impchrctc	Charitable donations	(PCHATL1, PCHATR1, PCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(PMAXDX)
impdtxc	Dividend tax credit	(PDTCR)
impedtxc	Education tax credit	(PEDXPM, PMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(PYPNDL)
imptutxc	Tuition Tax credit	(PMAXET)
impuietc	EI contributions tax credit	

The option to apply a minimum tax is controlled using PAMTOPT.

The Prince Edward Island labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The Prince Edward Island provincial credit is modeled as PLVCRT times the gross amount up to PLVCMAX. The credit cannot be more than provincial taxes (imtxp).

CROSS REFERENCE

Function Description

INPUT PARAMETERS:

PAMTOPT P.E.I. alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)

PAMTPCTF P.E.I. amt rate as pct of additional fed tax due to minimum tax
 PAMTTX P.E.I. amt rate as tax on adjusted income
 PAXM P.E.I. Age Amount
 PAXPI P.E.I. Age Amount phase in rate for 1994 and beyond
 PAXRR P.E.I. Age Amount credit reduction rate
 PAXTD P.E.I. Age Amount net income turndown
 PBXM P.E.I. Basic Personal Exemption/amount
 PCGTC P.E.I. Caregiver Tax Credit
 PCGTCFLG P.E.I. Caregiver Tax Credit activation flag
 PCGTCTC P.E.I. Caregiver tax credit take-up rate by age of elderly [age,rate]
 PCGTCTD P.E.I. Caregiver Tax Credit Turn Down Income
 PCGTCTK P.E.I. Caregiver tax credit take-up rate by income level [employment income,rate]
 PCHATL1 P.E.I. Charitable Donations amount level 1
 PCHATR1 P.E.I. Charitable Donations tax credit rate 1
 PCHATR2 P.E.I. Charitable Donations tax credit rate 2
 PDTCR P.E.I. dividend tax credit rate
 PEDXPM P.E.I. Education Amount per month
 PEMXM P.E.I. equivalent to married amount
 PEMXMT P.E.I. equivalent to married turndown level
 PLVCMAX Maximum P.E.I. labour-sponsored funds tax credit allowed
 PLVCRT Percent of P.E.I. labour-sponsored funds cost allowed as credit
 PMAXDX P.E.I. Maximum Disability deduction/amount
 PMAXET P.E.I. maximum on transfer of education and tuition amount
 PMXM P.E.I. married amount
 PMXMT P.E.I. married amount turndown level
 PPNTCR P.E.I. provincial non-refundable tax credit rate
 PPTC P.E.I. political contribution table [total donations,donation allowed]
 PPTCBEN Maximum P.E.I. political tax credit allowed
 PPTF P.E.I. provincial tax fraction
 PPTX P.E.I. tax table [taxable income,basic provincial tax]
 PSCI P.E.I. provincial tax above which surtax applies
 PSF P.E.I. provincial surtax rate
 PTRBAS Base PEI low income tax reduction
 PTRKID PEI low income tax reduction for dependent child
 PTRRR PEI low income tax reduction Reduction Rate
 PTRSP PEI low income tax reduction for spouse or equivalent-to-spouse
 PTRTD PEI low income tax reduction Turndown
 PTXFLG P.E.I. tax on taxable income activation flag
 PYPNDL P.E.I. Pension Income Deduction Amount

INPUT VARIABLES:

cfin First person in census family [pointer]
 cfinch First child in census family [pointer]
 cfineld Eldest person in census family [pointer]
 cfinspo Spouse of eldest [pointer]
 cfnchild Number of children (including 18+)
 cfnpers Number of persons in census family
 cfspoflg Census family contains married couple
 efin First person in economic family [pointer]
 efnpers Number of persons in economic family
 hhncf Number of census families in household

hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance
idefrh	Relationship to economic family head
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idipens	Pension income (115)
idlabtxg	Gross Labour funds bought (413)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idrand	Random numbers [array]
idtuitn	Tuition fees (320)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts (calculated)
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepni	Dependant's net income
imidivt	Dividend income (taxable)
iminet	Net income
imitax	Taxable income
immeda	Medical expenses allowed (computed)
imuic	UIC contributions
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imnptc	Non-refundable provincial tax credits
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgtc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transferred from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
imppentc	Prov Pension Income tax credit
impptc	Provincial Political Contrib Tax Credit
imprvtax	Prov gross provincial tax

impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptr	Provincial tax reduction
impttxct	Prov total tax credits transfered
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

txprov Compute provincial taxes

SUMMARY

Provincial income taxes are collected by the federal government on behalf of most provinces. Quebec collects its own income tax. Algorithms for computing provincial tax range from taking a proportion of Basic Federal Tax as in Newfoundland, Prince Edward Island, New Brunswick and Nova Scotia to a parallel of the federal system in Quebec. The other provinces begin with a proportion of federal taxes but have their own systems of tax credits, surtaxes and reductions.

CROSS REFERENCE

Function	Description
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INPUT VARIABLES:

hdprov	Province
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txqcalc Calculate income tax (Quebec)

SUMMARY

The txqcalc function calculates Quebec income tax for those individuals affected. It can be used to calculate either pre-1984 Quebec income tax or post-1988 (post-reform) income tax through the use of the parameter QREFOPT.

Program Description

Due to the complexity of the post-1988 reform Quebec income tax system, it has been

implemented in SPSM as a separate function.

SPSM Implementation

txqcalc can compute tax in two quite different ways, depending on the value of parameter QREFOPT.

If QREFOPT is set to 1, a pre-reform algorithm, very similar to that used in drv for computing federal tax is used.

If QREFOPT is set to 2, then a different algorithm is used. Each census family is processed in turn. First, the basic provincial tax is computed via a table look-up for each person. Next the non-refundable tax credits are applied and unused credits are transferred between spouses, if appropriate. Subsequently, the 'family situation' and 'eligible income' are computed followed by the family tax reduction. After the family tax reduction has been calculated, the refundable property tax credit is computed.

Relation to Other SPSM Routines

txqcalc is called from within txprov and is in a subsidiary relationship to it. It does not call, and is not called by, any further functions.

Sales tax credit

The refundable sales tax credit (imqstr) is activated when QSTRFLAG is set to 1. The sales tax credit includes a base credit (QSTRBCRD), a credit (QSTRCHILD) is added for each child in the family. A second credit is added (QSTRFTP3) when no spouse is present and at least one dependent child is present, And finally another credit is added (QSTRFTP4) is for a person living alone or with at least one dependent. The credit is reduced by the income considered at a rate QSTRRR.

Housing of Parent tax credit

The Housing of Parent Tax Credit (imqhptc) calculation is activated by a flag (QHPTCFLG) and the base tax credit is QHPTC. An economic family is eligible to the imqhptc if the parent or grandparent of the head of the economic family, or his/her spouse is in the economic family. A take-up rate QHPTCTC based on age of the potential parent assigns individuals with idefrh =3 as a parent according to SCF data. A take-up rate QHPTCTK based on employment income select the appropriate number of beneficiaries according to Portrait de la fiscalité des particuliers au Québec.

Medical Expenses tax credit

The calculation of the refundable tax credit for medical expenses is activated by the flag QMRTCFLG. The maximum refundable credit will be the lesser of QMEDRMAX and QMEDRATE percent of eligible medical expenses (imqmeda). The tax credit is reduced by QMEDRRR percent of net family income in excess of QMEDRTD. Eligibility is also limited to persons aged 18 and over with employment related earnings greater than

QMEDRMIN. The medical expenses tax credit was introduced in 1997.

Dues as non-refundable tax credit

Starting in 1997, dues that where a deduction (iddues) in txqinet are a tax credit activated by the option QDUESOPT = 2. The value of the tax credit is imqduetc. When QDUESOPT = 1, the dues are calculated in txqinet.

Tuition as non-refundable tax credit

Starting in 1997, tuition are considered as a deduction (idtuittn) in txqinet are now a tax credit activated by the option QTUIOPT = 2. The value of the tax credit is imqtuitc.

Family Allowance Tax Credit

The Quebec Family Allowance Tax Credit started in September 1997 but is implemented in the model starting 1998. The Quebec Family Allowance Tax Credit is a credit based on previous year net family income and is non-taxable. The maximum credits vary with the number of children (QFATCMXK), and a supplement QFATCSUP is allocated to single parent families. For families with 4 kids and more, a supplement, QFATCK6, is added that varies with the number of kids and the number of kids under 6 years of age. The credit is maximum until it reaches the first turn down income level with a specific reduction rate. The sequence of turn down incomes and reduction rates for single parent families are in QFATCSRR and for married couples in QFATCMRR. The turning point at QFATD4K is increased by QFATD4KI for each child over three. The benefits are reduced up to a minimum based on the number of children in the family (QFATCMNK) until the net family income reaches the last turning point in either QFATCSRR or QFATCMRR. At this last turning point the benefits are starting to reduce until they reach a minimum for payments of QFATCMIN. The program is implemented by copying the reduction rate table (QFATCSRR or QFATCMRR) into a temporary table. Then another temporary table assigns benefits and reduction rates to turning point incomes. Finally, the calculated benefits, imqfatc, are assigned to the women in the married couples or to the head of the single parent family. When activated, the take-up rate, QFATCTK, selects the assigned individual only if a random number is higher than the level specified by its total income. As a standard, QFATCTK is set to zero and all individuals are selected.

Alternative Minimum Tax

The Alternative Minimum Tax in Quebec started in 1986 and is now fully implemented. The calculation is activated by QAMTXFLG. The calculation of the income considered is slightly different than the Federal Alternative Minimum Tax because of difference in the rates considered for:

. the inclusion of an amount of capital in the income considered (QCAPAMTX),

- . the dividing factor for the dividends (QDIVRAT), and
- . the dividing factor for the capital gains (QCAPRAT).

The exemption level is QAMTX and the tax rate is QAMTTX. When the Alternative Minimum Tax is higher than the calculated tax using the standard algorithm, the difference is stored in imqamt. A flag, imqamtfg, identifies the individuals with the modified income tax. In 1995, the definition of income was changed and QAMTXREF indicates new components used in the calculation of taxable income.

When QAMTXSTKFLG is set to 1, the stock option deduction (imqstkdd) can be deducted when calculating the Quebec Alternative Minimum Tax.

Political Contribution

Starting in 1995, the political contribution is subject to two rates (QPCTR) instead of one (QPTC). The calculation procedure for 1995 and after is activated when QPCOPT is set to 2, otherwise it is the single rate that applies.

Labour-sponsored venture capital tax credit

The Quebec labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The Quebec provincial credit is modeled as QLVCRT times the gross amount up to QLVCMAX. The credit cannot be more than provincial taxes (imtxp).

Simplified tax program (low income credit)

The simplified tax program, which includes a flat tax credit, started in 1998. People were allowed to decide whether it was in their benefit to fill out the simplified or general tax form. A worksheet was provided in order to facilitate the choice.

The SPSM has implemented this tax system in the following way. When QSFOPT is set to 1, everyone in Quebec fills out the general tax form. This is the system which was in place prior to 1998. If QSFOPT is set to 2, then everyone fills in the simplified tax form. And when QSFOPT is set to 3, then an optimization procedure is run. In this scenario, an approximation of the worksheet which was provided with the 1998 tax form is calculated prior to the computation of taxes. People are assigned to either the general tax form (which includes all deductions) or the simplified tax form (which includes few deduction but an additional credit - QSFTC). The variable imqsfflg notes which form was chosen.

A person can transfer all of their extra credits and deductions to their spouse when both spouses fill out the simplified tax form. When using the general form, only a limited number of deductions can be transferred. Because the worksheet does not take into account all the inter-spouse complexities, the optimization procedure will tend to overstate taxes. While it is very accurate for single persons, it tends to maximize the individual's gain which is not necessarily the couple's gain. The model may therefore slightly overstate Quebec taxes.

At the same time, the number of income tax brackets in QTX is reduced from 5 to 3, the Surtax and the Tax Reduction are eliminated.

This tax change also signified the replacement of the age, living alone, and retirement credits with a combined family-based credit (imqcalr).

Improved Tax System for Self Employed Workers

The improved tax system for self employed workers in Quebec was added. This improved system was announced in the Quebec 2000 Budget to enable the increasing number of self-employed workers to benefit from the simplified tax form. This system will standardize the tax treatment applicable to that part of the contribution paid by a worker in respect of pensionable self-employed earnings that could be equated with an employer's contribution, and refrain from excluding a growing number of self-employed workers from the simplified tax system. When activated (QITSFSEW), it will result in a conversion of QITSSEF of the tax credit granted in respect of amounts payable as contributions on pensionable self-employed earnings to the CPP/QPP into a deduction in the calculation of income. This new deduction will be applied to the calculation of income under the simplified tax system and to the income used to determine the contribution to the Health Services Fund payable by individuals. The calculated amount of the contributions to be converted is held in imqcppse.

Charity and Gifts to the Crown as Tax Credit

The charity and gifts deduction is transformed in 1993 in a tax credit, imqchatc, and is used in the calculation of total non-refundable tax credits in txqcalc. When QGIFTOPT is set to one, imqchara is calculated and included in the deductions. Before 1998, QGIFTFLG set to zero, idgifts, was included without any limits. Starting 1998, QGIFTFLG set to 1, idgifts and idcharit are subject to the same calculation rules with a limit based on net income. The value of the tax credit is calculated in txqitax.

Refundable Tax Credit for Medical Expenses

When QMRTCFLG is assigned to 1, the Quebec refundable tax credit for medical expenses (imqmedrc) is calculated for persons aged 18 and over who had employment related earnings greater than QMEDRMIN. The maximum refundable credit will be the lesser of QMEDRMAX and QMEDRATE percent of eligible medical expenses (imqmeda). It is reduced by QMEDRRR percent of net family income in excess of QMEDRTD. When QMRTCFLG is assigned to 0, the calculation of the Quebec refundable tax credit for medical expenses is suppressed.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CCEATFLG	CCEA eligible->claimable transformation activation flag
CCEATFR	CCEA eligible->claimable fraction
CCEATLL	CCEA eligible->claimable lower limit
PYINC	Deflator to calculate previous year income
QAARC	Quebec availability allowance (refundable credit)
[parity,\$]	
QAARCFLAG	Availability Allowance: Refundable Tax Credit
QAMTTX	QAMTX tax rate
QAMTX	QAMTX exemption level
QAMTXFLG	Quebec alternative minimum tax, QAMTX, activation flag
QAMTXREF	Quebec alternative minimum tax 1995 reform indicator (flag)
QAMTXSTKFLG	QAMTX stock option deduction inclusion (1=stk can be deducted)
QAPFFLG	Quebec anti-poverty fund activation flag
QAPFRAT	Quebec anti-poverty fund rate
QAXM	Quebec age exemption/amount
QBXM	Quebec basic personal exemption/amount
QCALRFLG	Quebec combined age, living alone retirement credit
QCAPAMTX	QAMTX taxable capital ratio
QCAPGIR	Quebec capital gains inclusion rate
QCAPRAT	QAMTX capital gains ratio
QCCEAOLD	Quebec CCEA old child limit
QCCEAYNG	Quebec CCEA young child limit
QCCEOPT	Quebec CCE calculation option [1=deduction,2=refundable credit]
QCCETCR	Refundable CCE credit rate [net income, % cce claimable]
QCRDFLG	Quebec income credit flag [1=if social contribution are deducted]
QCTCDEPA	Quebec consumer tax credit dependant amount
QCTCFLAG	Quebec consumer tax credit activation flag
QDGUR	Quebec dividend gross-up rate
QDIVRAT	QAMTX dividends ratio
QDTCR	Quebec dividend tax credit rate
QDUESOPT	Quebec Dues Tax Credit option
QEIA1	Quebec eligible income family type #1
QEIA2	Quebec eligible income family type #2
QEIA3	Quebec eligible income family type #3
QEIA4	Quebec eligible income family type #4
QEIA5	Quebec eligible income family type #5
QEIAA	Quebec eligible income aged amount
QEMPLOFLAG	Database variable(emplo) activation flag
QFAMDED	Quebec Family related deduction on income in refundable credits
QFAMFLG	Quebec family income deduction activation flag
QFAMNETI	Quebec family allowance tax credit net income concept flag
QFAMRAT	Quebec family income rate
QFARFLAG	Quebec family allowance repayment flag

QFATCHIRR	QFATC High income reduction rate
QFATCHITD	QFATC High income turndown
QFATCK6	QFATC Supplement for kids under 6 in large families
[#kids][#kids<6]	
QFATCK6PYR	QFATC supplement for kids under 6 phase out year proportion
QFATCK6YR	QFATC Supplement for kids under 6 phase out year
QFATCMIN	QFATC minimum benefit paid
QFATCMNK	QFATC Minimum benefits by kid rank
QFATCMRR	QFATC turn down income levels and reduction rate for
married parents	
QFATCMXK	QFATC Maximum benefits by kid rank
QFATCOPT	Quebec Family Allowance Tax Credit Option tranfer=1, tax
credit=2	
QFATCSRR	QFATC turn down income levels and reduction rate for single
parent	
QFATCSUP	Quebec Family Allowance Tax Credit Supplement for single
parent	
QFATCTK	QFATC Take-up rates by total income
QFATD4K	QFATC turn down income for 4 children and more
QFATD4KI	QFATC turn down income increase by child for 4 children and
more	
QFTRA1	Quebec family tax reduction family type #1
QFTRA2	Quebec family tax reduction family type #2
QFTRA3	Quebec family tax reduction family type #3
QFTRA4	Quebec family tax reduction family type #4
QFTRFLAG	Quebec family tax reduction activation flag
QFTRRR	Quebec family tax reduction reduction rate
QGIFTOPT	Quebec gifts as tax credit
QHPTC	Quebec Housing Parent Tax Credit
QHPTCFLG	Quebec Housing Parent Tax Credit activation flag
QHPTCTC	QHPTC take-up rate by age of elderly [age,rate]
QHPTCTK	QHPTC take-up rate by income level [employment income,rate]
QHSCI	Quebec surtax first cut-in level
QHSCI2	Quebec surtax second cut-in level
QHSF	Quebec surtax first level rate
QHSF2	Quebec surtax second level rate
QITSFSEW	Quebec improved tax system for self-employed worker
activation flag	
QLAXM	Quebec living alone exemption/amount
QLVCMAX	Maximum Quebec labour-sponsored funds tax credit allowed
QLVCRT	Percent of Quebec labour-sponsored funds cost allowed as
credit	
QMEDINC	Income definition for Que. refundable tax credit for
medical expenses	
QMEDRATE	Proportion of expenses allowed for refundable tax credit
for medical expenses	
QMEDRMAX	Maximum expenses allowed for Que. refundable tax credit for
medical expenses	
QMEDRMIN	Minimum earnings for Quebec refundable tax credit for
medical expenses	
QMEDRRR	Reduction rate for the Que. refundable tax credit for
medical expenses	
QMEDRTD	Turndown level for Que. refundable tax credit for medical
expenses	
QMRTCFLG	Quebec refundable tax credits for medical expenses
activation flag	
QNORTHFLAG	Database variable(north) activation flag

QNTRC Quebec nominal tax credit rate
 QPARTLOFLAG Database variable(partlo) activation flag
 QPCOPT Quebec political contribution option
 QPCTR Quebec political contribution tax rates
 QPTC Quebec political contribution table [total donations,donation allowed]
 QPTCBEN Maximum Quebec political tax credit allowed
 QPTRGISB Quebec property tax rebate GIS bonus
 QPTRMTP Quebec property tax minimum tax per person
 QPTRMTR Quebec property tax maximum tax for reduction
 QPTRRR Quebec property tax rebate reduction rate
 QPTRTF Quebec property tax fraction
 QREFOPT Quebec deduction/credit option [1=deduction,2=credit]
 QRTRFLAG Quebec real estate rebate activation flag
 QSFDISFLAG Quebec Simplified Form Disability tax credit inclusion flag
 QSFOPT Quebec Simplified Form Option (1=general 2=simplified 3=optimized)
 QSFTC Quebec Simplified Form tax credit
 QSPBFLAG Quebec inclusion of social program benefits in income flag
 QSTRBCRD Quebec sales tax rebate base credit
 QSTRCHILD Quebec sales tax rebate children dependent credit
 QSTRFLAG Quebec sales tax rebate activation flag
 QSTRFTP3 Quebec sales tax rebate family type 3 credit
 QSTRFTP4 Quebec sales tax rebate family type 4 credit
 QSTROPT Quebec sales tax rebate option=1 based on imigis, =2 otherwise
 QSTRRR Quebec sales tax rebate reduction rate
 QTRBE Quebec Tax Reduction Breakeven
 QTROPT Quebec Tax Reduction calculation option 1=universal 2=income tested
 QTRP Quebec tax Reduction proportion
 QTUIOPT Quebec tuition tax credit option
 QTX Quebec income tax table [taxable income,basic provincial tax]
 QYPDL Quebec deduction limit for pension income
 TARGETYEAR Year of analysis

INPUT VARIABLES:

cfin First person in census family [pointer]
 cfinch First child in census family [pointer]
 cfineld Eldest person in census family [pointer]
 cfinspo Spouse of eldest [pointer]
 cfnkids Number of children in census family
 cfnpers Number of persons in census family
 cfspoflg Census family contains married couple
 efin First person in economic family [pointer]
 efnpers Number of persons in economic family
 hdnadult Number of adults in household
 hdnpers Number of persons in household
 hhncf Number of census families in household
 hhnef Number of economic families in household
 hhnin Number of individuals in household
 hhnnf Number of nuclear families in household
 idage Age
 idcarry Carrying charges (221)
 idccet Child care expenses associated with child
 idccett Child care expenses (Limit A, Form T778)

idcfrh	Relationship to census family head
iddisab	Disability status
idefrh	Relationship to economic family head
idemplo	Employee home relocation loan dedn (248)
idexplor	Exploration and development expenses (224)
idicapg	Capital gains (actual)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idlabtxg	Gross Labour funds bought (413)
idnclos	Allowable other years non-capital loss (252)
idnorth	Northern deductions (255)
idothded	Other deductions from total income (232)
idpartlo	Limited partnership losses (251)
idprvpol	Provincial political contributions (565)
idrand	Random numbers [array]
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idsex	Sex
idspoflg	Person has spouse
imigis	GIS benefits
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
immtot	Total income
impfa	Provincial family allowance
improptx	Imputed property tax paid
imqalexp	Quebec allowable employment expenses
imqatc	Quebec age tax credit
imqbtc	Quebec basic tax credit
imqcapgx	Quebec modelled capital gains deduction (254)
imqcchc	Quebec child's non-refundable credit
imqcdeds	Quebec dependent children deduction
imqchatc	Quebec allowable charitable donations tax credit
imqcppse	Quebec self-employ. QPP/ CPP Cont. deduction
imqcpptc	Quebec CPP/QPP contributions tax credit
imqdctc	Quebec dependent child tax credits
imqdedt	Quebec deductions transfered from spouse
imqdistc	Quebec disability tax credit
imqduetc	Quebec Dues Tax Credit
imqhsfc	Quebec Health Services Fund Contributions
imqhsftc	Quebec Health Services Fund Cont.tax credit
imqidivt	Quebec taxable dividends
imqinet	Quebec net income
imqintdn	Quebec interest income deduction allowed
imqitax	Quebec taxable income
imqitot	Quebec total income
imqlatc	Quebec living alone tax credit
imqmeda	Quebec medical expenses allowed
imqmtc	Quebec married tax credit
imqndc	Quebec number of dependent children
imqritc	Quebec retirement income tax credit
imqsfflg	Quebec simplified tax form flag 0=general 1=simplified
imqstkdd	Quebec modelled Stock option deduction (249)
imqtfa	Quebec taxable family allowances

imqtuitc	Quebec Tuition Tax Credit
imquictc	Quebec UI contributions tax credit
nfinch	First child in nuclear family [pointer]
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imnptc	Non-refundable provincial tax credits
implvctc	Provincial labour-sponsored funds tax credit
impptc	Provincial Political Contrib Tax Credit
impsur	Provincial surtax
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
imqaarc	Quebec Availability Allowance Refunded Tax Credit
imqamt	Quebec Minimum Tax Amount
imqamtfg	Quebec Minimum Tax flag
imqapf	Quebec Anti-Poverty Fund
imqcalr	Quebec combined age, living alone, retirement credit
imqcceni	Quebec net income for refundable cce credit calculation
imqccetc	Quebec refundable child care expenses Tax Credit
imqdtxc	Quebec dividend tax credit
imqei	Quebec eligible income for tax reduction
imqfatc	Quebec Family Allowance Tax Credit
imqfs	Quebec family situation (1-5)
imqftr	Quebec family tax reduction
imqhptc	Quebec Home Parent Tax Credit level
imqittr	Quebec income tested tax reduction
imqmedrc	Quebec refundable tax credit for medical expenses
imqptr	Quebec property tax refund
imqrepay	Quebec repayments
imqstr	Quebec sales tax refund
imqtca	Quebec tax credits applied
imqtct	Quebec tax credits transferable
imqtcts	Quebec tax credits transferred from spouse
imqtottc	Quebec total tax credits
imtxp	Provincial income tax payable

txqcea Compute child care expense allowance (Quebec)

SUMMARY

Since the amounts allowable for the Child Credit Expense Deduction differ slightly between the federal and Quebec provincial tax systems, it would be desirable to use the actual amount allowed for Quebec provincial tax purposes in the calculation of this deduction. The rules for eligibility exactly parallel the federal (see txcea). The algorithms are therefore essentially the same as the ones modeling the allocation of the federal Child Care Expense Deduction.

Unlike the federal algorithm, child care expenses are always treated as a deduction from total income. There is no option for treating them as a tax credit.

CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

CCEATFLG	CCEA eligible->claimable transformation activation flag
CCEATFR	CCEA eligible->claimable fraction
CCEATLL	CCEA eligible->claimable lower limit
QCCEAC1	Quebec CCEA earned income fraction (1 child)
QCCEAC2	Quebec CCEA earned income fraction (2 children)
QCCEAC3	Quebec CCEA earned income fraction (3+ children)
QCCEAOLD	Quebec CCEA old child limit
QCCEAYNG	Quebec CCEA young child limit
QCCEOPT	Quebec CCE calculation option [1=deduction,2=refundable credit]

INPUT VARIABLES:

cfinch	First child in census family [pointer]
cfinel	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnkids	Number of children in census family
cfspoflg	Census family contains married couple
hhncf	Number of census families in household
idage	Age
idccet	Child care expenses associated with child
idccett	Child care expenses (Limit A, Form T778)
idiemp	Wages & salaries
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming

OUTPUT VARIABLES:

imqcea	Quebec child care expenses allowed (dedn)
imqdedft	Quebec deductions from total income
imqinet	Quebec net income

txqhstr	Compute family-related deductions or credits (Quebec)
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SUMMARY

This function parallels txhstr which performs similar calculations for federal taxes. The major difference is that the model does not incorporate the conversion of deductions into tax credits for the calculation of Quebec taxes. The algorithms include:

- calculate and allocate Personal Exemptions for Wholly Dependent Children
- calculate and allocate Married Exemption
- calculate Family Support Exemption (similar to federal Married Equivalent Exemption)
- calculate and transfer deductions from spouse

Calculate and Allocate Personal Exemptions for Wholly Dependent Children

Quebec filers with dependent children are eligible to claim an exemption based on the age and net income of the child. The exemption is calculated as a fixed amount minus a proportion of the child's net income exceeding the reduction level. The young child exemption is claimable on behalf of children aged 16 or 17. The old child exemption is claimable on behalf of children 18 and over but under 21, or over 20 and attending school full-time.

For taxation year 1986 and later, the definition of dependant's net income for the purpose of calculating the Exemption for Wholly Dependent Children requires the addition of the following amounts on non-taxable income to the standard definition of net income:

- Guaranteed Income Supplement, Spouse's Allowance
- CSST Compensation
- Social Aid Benefits
- earnings from international sources which are tax exempt in Canada

SPSM Implementation

The amount of the exemption on behalf of children 16 or 17 is calculated by subtracting the proportion of the child's Net Income (imqinet) which exceeds the Reduction Level (QYCT) from the Maximum Young Child Exemption (QYCX).

If the child is 18 or over but under 21, or over 20 and attending school full-time, the amount of the exemption is calculated by subtracting the proportion of the child's Net Income (imqinet) which exceeds the Reduction Level (QOCT) from the Maximum Old Child Exemption (QOCX).

The exemptions for all children are accumulated in cdedes which may later be adjusted by the calculation of the Family Support Exemption. If a spouse is present, the one with the higher Net Income (imqinet) receives the full amount of the exemption for all dependent children (imqcdeds) which is used to reduce Taxable Income (imqitax).

The model does not partition the exemptions for dependent children between spouses as is allowed by the tax regulations. This means that the tax burden of spouses with similar net incomes is not minimized.

In calculating the amount of the exemption, the model does not adjust the Net Income of the dependant to include certain non-taxable amounts of the Guaranteed Income Supplement (GIS), Spouse's Allowance (SPA) or Social Assistance as is specified in the Quebec tax regulations.

Calculate and Allocate Married Exemption

Persons legally married during the taxation year are eligible to claim a Married Exemption amounting to a fixed value reduced by a proportion of the spouse's net income exceeding a reduction level. The definition of spouse's net income for the purpose of calculating the Married Exemption requires the addition of the following amounts on non-taxable income to the standard definition of net income:

- Guaranteed Income Supplement, Spouse's Allowance
- CSST Compensation
- Social Aid Benefits
- earnings from international sources which are tax exempt in Canada

SPSM Implementation

The Married Exemption (*imqmarex*) is calculated only for the spouse with the lower Net Income (*imqinet*). It amounts to a fixed value (*QMXM*) reduced by the proportion of the other spouse's Net Income which exceeds the Reduction Level (*QMXT*). *imqmarex* is used to reduce the taxable income (*imqitax*) of the claiming spouse.

Note that the value of Net Income is not adjusted to include GIS, SPA, Social Aid and non-taxable amounts from international sources. GIS and SPA are calculated later in the model and the amounts are not available when this function is executed. Non-taxable amounts from international sources cannot be separated from other non-taxable income in the database.

Calculate Family Support Exemption

The definition of the Family Support Exemption is similar to the federal Married Equivalent Exemption. Filers who are single, divorced, separated or widowed and who supported a relative related by blood, marriage or adoption are eligible to claim that relative for a Family Support Exemption. This exemption amounts to a fixed value reduced by a proportion of the dependant's net income exceeding a reduction level.

The definition of the dependant's net income for the purpose of calculating the Family Support Exemption requires the addition of the following amounts on non-taxable income to the standard definition of net income:

- Guaranteed Income Supplement, Spouse's Allowance
- CSST Compensation
- Social Aid Benefits
- Earnings from international sources which are tax exempt in Canada

SPSM Implementation

SPSM calculates the Family Support Exemption on behalf of dependent children and not other relatives who may be eligible.

The model attempts to make the claim on behalf of the dependant for whom a claim will benefit the filer most. The first choice for the exemption is a dependant who is not claimable for the child exemption, i.e., one who is 15 years of age or younger, or one who is over 21 and not attending an educational institution. If more than one dependant is eligible under

these conditions, then the one with the lower Net Income (imqinet) is chosen. If there is no such dependant, the dependant claimable for the child exemption with the lowest Net Income is chosen.

The Family Support Exemption (imqmarex) is calculated as a fixed amount (QMXM) reduced by the proportion of the dependant's Net Income (imqinet) exceeding the Reduction Level (QMXT).

If the Family Support Exemption is claimed on behalf of a dependant who is also claimable for the child exemption, the accumulated amount of the child exemption is adjusted by subtracting the amount claimed for that dependant.

The Family Support Exemption (imqmarex) is added to Total Personal Exemptions (imqpex) and subtracted from Taxable Income (imqitax).

Calculate and Transfer Deductions From Spouse

As in the federal case (see the function txhstr) Quebec allows the transfer of certain deductions from the spouse in the calculation of provincial income taxes. Deductions which may be transferred are:

- Age Exemption
- Interest and Dividend Income Deduction
- Deduction for Retirement Income
- Disability Deduction

Only the amount not required to reduce the spouse's taxable income to zero may be transferred. There is a limit to the amount of combined Interest and Dividend Income Deduction and Pension Income Deduction transferable which amounts to the unused proportion of the Married Exemption, i.e., if the full Married Exemption was claimed, no portion of these two deductions may be transferred.

SPSM Implementation

For the spouse with the lower Net Income (imqinet) the model calculates a value for potentially transferable deductions as the sum of:

- Age Exemption (imqaxm)
- Disability Deduction (imqdisex)

the lesser of:

- Total Pension Income Deduction (imqpendn) and Interest Income Deduction (imqintdn), and
- the unused portion of the Married Exemption (QMXM minus imqmarex).

minus any amount required to reduce the spouse's Taxable Income to zero (imqinet minus QBXM).

The amount transferred from the spouse is subtracted from the filer's Taxable Income

(imqitax) and added to Total Deductions from Net Income (imqdedfn). The spouse's Taxable Income and deductions are not adjusted because, if a transfer occurs, taxable income is zero by definition. The amounts recorded for the individual deductions (e.g., imqaxm, imqpendn) are not adjusted to reflect the transfer.

The value of Net Income used in the calculation of the transfer is not adjusted to include GIS, SPA and Social Aid income.

Calculate Living alone tax credit

The calculation of the living alone tax credit imqlatc is based on the value of the tax credit QLAXM adjusted by the nominal tax credit rate (QNTCR).

Starting in 1996, the calculation of the living alone tax credit is subject to turndown income (QLAXTD) and a reduction rate (QLAXRR) for net income (imqinet) in excess. In 1996, the reduction is only 50% and 100% after, and it is controlled by the phase in variable QLAXPI.

When QCALRFLG is activated, the combined age, living alone, and retirement credit is activated (imqcalr) and imqlatc is set to zero.

CROSS REFERENCE

Function Description

INPUT PARAMETERS:

QBXM	Quebec basic personal exemption/amount
QCALRFLG	Quebec combined age, living alone retirement credit
QCXMOPT	Quebec child exemption method option (1=pre-86 2=86+)
QITSFSEW	Quebec improved tax system for self-employed worker activation flag
QLAXM	Quebec living alone exemption/amount
QLAXPI	Quebec living alone phase-in
QLAXRR	Quebec living alone reduction rate
QLAXTD	Quebec living alone turn down
QLPXM	Quebec lone parent exemption/amount
QMEDINC	Income definition for Que. refundable tax credit for medical expenses
QMXM	Quebec married exemption/amount
QMXT	Quebec married exemption turndown
QNTCR	Quebec nominal tax credit rate
QOCT	Quebec exemption turndown for children 18 and over
QOCX	Quebec exemption for children 18 and over
QPSXM	Quebec post-secondary exemption/amount
QREFOPT	Quebec deduction/credit option [1=deduction,2=credit]
QSPBFLAG	Quebec inclusion of social program benefits in income flag
QYCT	Quebec exemption turndown for children 16 or 17
QYCX	Quebec exemption for children 16 or 17
QYCXM1	Quebec dependent child #1 amount

QYXXM2 Quebec dependent child #2 amount

INPUT VARIABLES:

cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfspoflg	Census family contains married couple
hdnpers	Number of persons in household
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idestat	Educational status
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
imigis	GIS benefits
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imqaxm	Quebec age personal exemption
imqcppse	Quebec self-employ. QPP/ CPP Cont. deduction
imqdisex	Quebec disability exemption
imqinet	Quebec net income
imqintdn	Quebec interest income deduction allowed
imqitot	Quebec total income
imqpendn	Quebec pension income deduction allowed

OUTPUT VARIABLES:

imqcchc	Quebec child's non-refundable credit
imqcdeds	Quebec dependent children deduction
imqdctc	Quebec dependent child tax credits
imqddefn	Quebec all deductions from net income
imqdedt	Quebec deductions transferred from spouse
imqdepni	Quebec dependant's net income
imqitax	Quebec taxable income
imqlatc	Quebec living alone tax credit
imqmarex	Quebec married exemption claimed
imqmtc	Quebec married tax credit
imqndc	Quebec number of dependent children
imqpex	Quebec personal exemptions and deductions

txqinet Compute net income (Quebec)

SUMMARY

The Quebec provincial personal income tax system largely parallels the federal system: deductions and exemptions reduce total income to a taxable amount for which the basic provincial tax is calculated, then tax credits are applied to derive the amount of provincial tax payable. The function calculates net income for Quebec taxpayers and is similar to the process for calculating net income for federal income tax purposes.

SPSM Implementation

The algorithms for calculating Net Income for Quebec Provincial Income Tax Purposes are similar to the algorithms for calculating federal Net Income described under the function `txinet`. The major difference is that there are no options to treat deductions and personal exemptions as tax credits.

Whenever possible values already calculated in the computation of federal Net Income are applied here. The implementation of specific measures are described below.

Employment Expense Deduction

The calculation of the Quebec Employment Expense Deduction (`imqdedea`) is the same as the federal case. `imqdedea` is a proportion (QEAP) of Earnings from Employment (`idiemp`) up to a maximum deduction of QEAMAX. There is no flag controlling the calculation of this value. If this deduction is to be eliminated, the values of QEAP and QEAMAX may be set to zero.

This value is added into Total Deductions from Total Income (`imqdedft`) in contrast to the federal algorithm in which the amount is subtracted from Total Income.

Other Allowable Employment Expenses

The model assumes that the definition for Other Allowable Employment Expenses as applied to Quebec Provincial Taxes is the same as the federal definition (see `txinet`). The same value as used in the federal algorithm (`idalexp`) is used here. The value of `idalexp` may be scaled up or down by supplying an appropriate value for the parameter QALEXP (Proportion of Other Allowable Employment Expenses to Use as a Deduction).

The amount `idalexp` is added to Total Deductions from Total Income (`imqdedft`) in contrast to the federal algorithm in which the amount is subtracted from Total Income.

Calculate Taxable Capital Gains

Capital Gains are treated as they are for federal taxes (see function `txinet`). Taxable Capital Gains for Quebec Provincial Tax Purposes (`imqcapgt`) is calculated as Total Capital Gains Received (`idicapg`) multiplied by the Capital Gains Inclusion Rate for Quebec Provincial Taxes (QDGUR).

Taxable Dividends

The treatment of dividends is similar to the federal algorithms described under the function `txinet`. Taxable Dividends for Quebec Provincial Taxes (`imqidivt`) are calculated as Total Dividends Received (`ididiv`) multiplied by the Quebec Dividend Gross-up Rate (QDGUR).

Calculation of Total Income

As in the federal case (see function `txinet`), Total Income at this stage does not include Family Allowances which cannot be allocated until it is known whether the mother or the

father have the higher net income. Total Income (imqitot) is calculated as the sum of:

idiemp:	Earnings From Employment
idisenf:	Self-employment Earnings (Non-farm), optionally scaled by the parameter FACTISENF
idisefm:	Self-employment Earnings (farm)
idiint:	Interest Income
idioinv:	Other Investment Income
idicqp:	CPP/QPP Benefits Received
iditogv:	Other Taxable Government Income
idipens:	Pension Income
iditoth:	Other Taxable Income
imiuib:	Modeled Unemployment Insurance Benefits Received
imiotg:	Modeled New Taxable Demogrants
imffa:	Modeled Family Allowance Benefits (optional)
imioas:	Modeled OAS Benefits
imqidivt:	Modeled Taxable Amount of Dividends for Quebec
imqcapgt:	Modeled Taxable Capital Gains and Losses for Quebec

The parameter QFAIFLAG controls whether federal Family Allowances are included in total income. If QFAIFLAG is set to one then imffa is added to imqitot. Also, Employment Expenses (imqdedia) and Other Allowable Employment Expenses (imqalex) are added into All Deductions from Total Income (imqdedft) and not subtracted from Total Income as in the federal algorithms.

Calculation of Net Income

All Deductions from Total Income (imdedft) is calculated as the sum of:

idrpp:	Registered Pension Plan Contributions
idrrsp:	Registered Retirement Savings Plan Contributions
iddues:	Union and Professional Dues
idtuin:	optionally, Tuition Fees
imqiloss:	Allowable Business Investment Loss
idothded:	Other Deductions from Total Income (includes Moving Expenses, Alimony Paid, Repayment of Income Amounts, Legal and Accounting Fees, Petroleum Exploration Ventures, Capital Cost Allowance on Canadian Motion Picture Films and Video Tapes)
idcarry:	Carrying Charges (interest on money borrowed to earn investment income)
imcqppc:	optionally, CPP/QPP Contributions (calculated in txinet)
imuic:	optionally, UI Contributions (calculated in txinet)
imqceea:	optionally, Child Care Expense Deduction Allowed (calculated separately in function txqceea)
imqdedia:	Employment Expenses
imqalex:	Other Allowable Employment Expenses

Please note that the Quebec algorithms are current for taxation year 1984. Unlike the algorithms modeling the federal tax system, there are, at this time, no switches for the

optional treatment of deductions as tax credits. The algorithms for Quebec do not currently implement either the Capital Gains Deduction or the Alternative Minimum Tax.

Dues as a tax credit

The dues as a deduction is activated by the option QDUESOPT = 1. Starting in 1997, dues are used in txqcalc as a non-refundable tax credit and QDUESOPT is set to 2.

Tuition as a tax credit

The tuition as a deduction is activated by the option QTUIOPT = 1. Starting in 1997, tuition is used in txqcalc as a non-refundable tax credit and QDUESOPT is set to 2.

Improved Tax System for Self-Employed Workers

The improved tax system for self employed workers in Quebec was added. When activated by QITSFSEW, it will result in a conversion of QITSSEF of the tax credit granted in respect of amounts payable as contributions on pensionable self-employed earnings to the CPP/QPP into a deduction in the calculation of income. This new deduction will be applied to the calculation of income under the simplified tax system and to the income used to determine the contribution to the Health Services Fund payable by individuals.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CPPXM	CPP/QPP exemptible earnings
QALEXP	Quebec proportion of other allowable employment expenses to use
QCAPGIR	Quebec capital gains inclusion rate
QCPPOPT	Quebec CPP/QPP contribution deduction/credit option [1=deduction,2=credit]
QDGUR	Quebec dividend gross-up rate
QDTCR	Quebec dividend tax credit rate
QDUESOPT	Quebec Dues Tax Credit option
QEAMAX	Quebec maximum employment allowance deduction
QEAP	Proportion of earnings for Quebec employment allowance deduction
QEEXPDED	Quebec employment expenses deduction application flag
QEMPLOFLAG	Database variable(emplo) activation flag
QHSC	Quebec Health Services Fund Contribution table
QHSCDIR	Quebec Health Services Fund Contribution Dividend inclusion rate
QHSOASFG	Quebec Health Services Fund Contribution OAS Deduction flag

QITSFSEW Quebec improved tax system for self-employed worker
 activation flag
 QITSSEF Quebec percentage of self-employ CPP/QPP contributions to
 convert to deduction
 QMAXDX Quebec maximum disability deduction/amount
 QMEDANF Quebec medical allowance lower limit net income fraction
 QNORTHFLAG Database variable(north) activation flag
 QNTCR Quebec nominal tax credit rate
 QPARTLOFLAG Database variable(partlo) activation flag
 QREPNETFG Social program repayments reduce Quebec net income flag
 QSFDISFLAG Quebec Simplified Form Disability tax credit inclusion flag
 QSFOPT Quebec Simplified Form Option (1=general 2=simplified
 3=optimized)
 QSFSMXI Quebec simplified form spouse maximum income for work sheet
 QSFTC Quebec Simplified Form tax credit
 QSPBFLAG Quebec inclusion of social program benefits in income flag
 QTUIOPT Quebec tuition tax credit option
 QTX Quebec income tax table [taxable income,basic provincial
 tax]
 QUICOPT Quebec UI contributions deduction/credit option
 [1=deduction,2=credit]
 WSCF CPP/QPP contribution rate on employment earnings
 YMPE CPP/QPP maximum pensionable earnings

INPUT VARIABLES:

hhnin Number of individuals in household
 idalexp Other allowable employment expenses (229)
 idcarry Carrying charges (221)
 idclos Allowable other years capital loss (253)
 iddalimo Alimony paid (220)
 iddisoth Disability amount for dependants (318)
 iddisself Disability amount for self (316)
 iddues Union and professional dues (212)
 idemplo Employee home relocation loan dedn (248)
 idexplor Exploration and development expenses (224)
 idicapg Capital gains (actual)
 idicqp CPP/QPP income (114)
 ididiv Dividend income (actual)
 idiemp Wages & salaries
 idiint Interest income (121)
 idiloss Business investment losses (217)
 idinspo Person's spouse [pointer]
 idioinv Other investment income with net rental
 idipens Pension income (115)
 idisefm Self-employed income - farming
 idisenf Self-employed income - non-farming
 iditgov Other government income (taxable)
 iditoth Other non-government income (taxable)
 iditrresp Taxable RRSP withdrawls
 idmedgro Medical expenses, gross (330)
 idmovexp Imputed moving expenses (219)
 idnclos Allowable other years non-capital loss (252)
 idnorth Northern deductions (255)
 idothded Other deductions from total income (232)
 idpartlo Limited partnership losses (251)
 idrpp Registered pension plan contributions (207)
 idrrsp RRSP calculated amount (208)

idspoflg	Person has spouse
idstkded	Stock option deduction (249)
idtuitn	Tuition fees (320)
imcqqpc	CPP/QPP contributions
imigis	GIS benefits
iminet	Net income
imioas	OAS benefits
imiotg	Other taxable demogrants
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitot	Total income
imiuib	Unemployment Insurance/Employment Insurance benefits
imninc	No income flag
imoasr	OAS recovery
imqtfa	Quebec taxable family allowances
imrepay	Social Benefits Repayments
imuibr	UI benefit recovery
imuic	UIC contributions

OUTPUT VARIABLES:

imqalexp	Quebec allowable employment expenses
imqcapgt	Quebec taxable capital gains
imqcppse	Quebec self-employ. QPP/ CPP Cont. deduction
imqcpptc	Quebec CPP/QPP contributions tax credit
imqdedea	Quebec employment allowance
imqdedft	Quebec deductions from total income
imqduetc	Quebec Dues Tax Credit
imqidivt	Quebec taxable dividends
imqiloss	Quebec Modelled Business investment losses (217)
imqinet	Quebec net income
imqitot	Quebec total income
imqsfflg	Quebec simplified tax form flag 0=general 1=simplified
imqtuitc	Quebec Tuition Tax Credit
imquictc	Quebec UI contributions tax credit

txqitax Compute taxable income and individual credits (Quebec)

SUMMARY

The process of computing taxable income for Quebec provincial taxes parallels that of the federal method. The following deductions are calculated and subtracted from Net Income (imqinet) to derive a tentative value for Taxable Income (imqitax):

imqpendn:	Pension Income Deduction
imqintdn:	Interest Income Deduction
imqstddn:	Combined Medical Expense Deduction, Charitable Donations and Gifts to Canada or a Province
imqdisex:	Disability Deduction
imqdedfn:	Calculate Deductions from Net Income
imqaxm:	Age Exemption

imqexm: Basic Exemption

The computation of Taxable Income is completed by the function txqhstr which calculates exemptions for dependents and performs the transfer of deductions between members of the family.

Unlike the algorithms for the calculation of Federal Taxable Income, this function contains no options for converting these deductions into tax credits.

Pension Income Deduction

Depending upon the filer's age and the type of income, pension and retirement income may be eligible for the Pension Income Deduction. Any portion of this deduction not required to reduce a filer's taxable income to zero may be transferred to the spouse.

SPSM Implementation

The Modeled Pension Income Deduction (imqpendn) is calculated as the lesser of:

- a) Eligible Pension Income (idipens), and
- b) the Maximum Pension Income Deduction (QYPDL)

The Modeled Pension Income Deduction (imqpendn) is added to Total Deductions from Net Income (imqdedfn) which is subsequently subtracted from Net Income (imqinet).

The function txqhstr may transfer some amount of the Pension Income Deduction to the spouse. In this event, adjustments are made to imqdedfn and imqinet but not to imqpendn.

The model assumes that the value of idipens represents pension income eligible for this deduction. No further checks are made to ensure that the pension is of the appropriate type for the age of the filer.

After the reform in 1988, the non-refundable tax credit for pension income (imqritc) was the minimum of the base credit (QYPDL) and the eligible pension income (idipens). Starting in 1996, the calculated deduction for pension income (imqritc) based on the credit (QYPDL) is now subject to turndown income (QYPTD) and a reduction rate (QYPRR) for pension income (idipens) in excess. In 1996 the reduction is only 50% and 100% after and it is controlled by the phase in variable QYPPI.

When QCALRFLG is activated, the combined age, living alone, and retirement credit is activated (imqcalr) and imqritc is set to zero.

Interest Income Deduction

Interest income and dividends from Canadian sources are eligible for the Interest Income Deduction. This deduction amounts to the lesser of a fixed amount (\$1,000 in 1984) and the eligible income. Any portion of the deduction not required to reduce the filer's taxable income to zero may be transferred to the spouse.

SPSM Implementation

The Interest and Dividend Income Deduction (imqintdn) is calculated as the lesser of:

- a) the Maximum Interest and Dividend Income Deduction (QYIDL), and
- b) the sum of Interest Income (idiint) and Dividends (imqdivt) minus Carrying Charges (idcarry).

The deduction is added to Total Deductions from Net Income (imqdedfn) which is subsequently subtracted from Net Income (imqinet) to derive Taxable Income (imqitax).

Since the Interest and Dividend Income Deduction is transferable between spouses, the function txqhstr may adjust the values of imqdedfn and imqitax. The value of imqintdn is not adjusted to reflect a transfer to the spouse.

Medical Expense and Charitable Donations Deduction

The filer is allowed a deduction for certain medical expenses, charitable donations and gifts to Canada or a province. In 1984, eligible medical expenses were deductible if they exceeded 3% of Net Income. Deductible charitable donations were limited to 20% of Net Income.

In 1984, if combined medical expenses, charitable donations and gifts to Canada or a Province did not exceed \$100, no receipts were required as proof. This was called the Standard Deduction. The Standard Deduction was eliminated in 1986. From then on, all medical expenses and charitable donations required proof.

Before 1997, the calculation of the medical exemption in txqitax was based on individual income (activated by QMEDOPT set to 1 with QMEDALL limitation). Starting in 1997, (with QMEDOPT set to 2) and the exemption is based on net family income without the limitation of QMEDALL. The credit is allocated to the spouse with the highest net income.

SPSM Implementation

The database contains variables representing the federal Medical Expense Deduction Allowed (immeda) and combined Eligible Charitable Donations and Gifts to Canada or a Province (imchara). Net Medical Expenses represent medical expenses in excess of 3% of Net Income. Eligible Charitable Donations represent charitable donations not exceeding 20% of Net Income.

The Combined Medical Expense and Charitable Donations Deduction (imqstddn) is calculated by taking the higher of:

- a) the Standard Deduction (QSTD), which may be zero, and
- b) the sum of Net Medical Expenses Allowed (imqmeda), Eligible Charitable Donations and Gifts to Canada or a Province (imqchara).

The variable imqstddn is added to Total Deductions from Net Income (imqdedfn) which is subsequently used to reduce Taxable Income.

Disability Deduction

As in the case of the federal income tax system, Quebec allows a special deduction for blind persons or persons confined to a bed or a chair. Any unused portion of the Disability Deduction may be transferred to a spouse or supporting parent.

SPSM Implementation

The database contains a value of the Disability Deduction Allowed on behalf of the filer, spouse or dependents (iddisex) . If this value is non-zero, the Quebec Disability Deduction (imqdisex) takes on the value assigned to the parameter QMAXDX. imqdisex is added in to Total Deductions from Net Income (imqdedfn) which is subsequently subtracted from Net Income.

Since this deduction is potentially transferable, the function txqhstr checks the relative net incomes of the head and spouse and performs any necessary transfers. The values of imqdedfn and imqitax are adjusted to reflect these changes. The value of imqdisex is not updated if the Disability Deduction is transferred to a spouse.

The model does not transfer unused portions of the Disability Deduction from dependant to parent. This probably does not cause a large error since the value on the database already takes into account amounts transferred from the spouse or dependents. The transfer between head and spouse is repeated in txqhstr because the estimate of Net Income is more accurate at this stage than during the database creation process.

Calculate Deductions from Net Income

The variable imqdedfn stores the value of All Deductions from Net Income. It is calculated as the sum of:

imqstdn:	Combined Medical Expense and Charitable Donations Deduction
imqintdn:	Interest and Dividend Income Deduction
imqpendn:	Pension Income Deduction
imqdisex:	Disability Deduction
imuibr:	Unemployment Insurance Benefits Reimbursed
idclos:	Capital Losses from Other Years
idnclos	Non-capital Losses from Other Years

The variable imqdedfn is subtracted from Net Income (imqinet) and may be adjusted in the function txqhstr if deductions are transferred between spouses.

The model does not include the Exemption for Members of a Religious Order, the Exemption for Dependents Aged 21 and Over Suffering from a Physical or Mental Infirmary, Deduction for a Home Relocation Loan, the Sociétés de placements dans l'entreprise québécois Deduction, or the Capital Gains Deduction.

Basic Exemption

Each filer claims a Basic Exemption which is subtracted from Net Income. The Amount of the Basic Exemption for Quebec Provincial Income Taxes is increased occasionally.

SPSM Implementation

For all filers with income, the Quebec Basic Exemption (QBXM) is added to the variable `imqexm` which accumulates personal exemptions. `imexm` is subsequently added to `impqex` which accumulates all exemptions and is later subtracted from Net Income `imqinet`.

Age Exemption

All filers who were 65 years of age or older during the taxation year claim the Age Exemption. The value of the Age Exemption is increased occasionally. Any unused portion of the Age Exemption may be transferred to the spouse.

SPSM Implementation

The Modeled Quebec Age Exemption (`imqaxm`) is assigned the value of the parameter `QAXM` for all filers 65 or over (`idage >= 65`) if they have income (`imninc > 0`). This value is added to `imqexm` (All Personal Exemptions on behalf of filer) which is subsequently added to `impqex` (All Personal Exemptions) and subtracted from Net Income `imqinet`. The function `txqhstr` may transfer the unused portion of the Age Exemption to the spouse and make corresponding adjustments to the value of `imqinet` but not to `imqaxm`.

Starting in 1996, the calculation of the age exemption tax credit is subject to turndown income (`QAXTD`) and a reduction rate (`QAXRR`) for net income (`imqinet`) in excess. In 1996, the reduction is only 50% and 100% after, and it is controlled by the phase in variable `QAXPI`.

Medical exemption calculation

Before 1997, the calculation of the medical exemption was based on individual income (activated by `QMEDOPT` set to 1 with `QMEDALL` limitation). Starting in 1997, the calculation of the medical exemption is transferred to `txqhstr` (with `QMEDOPT` set to 2) and the exemption is based on net family income without the limitation of `QMEDALL`. The credit is allocated to the spouse with the highest net income.

Charity and Gifts to the Crown as Tax Credit

The charity and gifts deduction is transformed in 1993 in a tax credit, `imqchatc`, and is used in the calculation of total non-refundable tax credits in `txqcalc`. When `QGIFTOPT` is set to one, `imqchara` is calculated and included in the deductions. Before 1998, `QGIFTFLG` set to zero, `idgifts`, was included without any limits. Starting 1998, `QGIFTFLG` set to 1, `idgifts` and `idcharit` are subject to the same calculation rules with a limit based on net income. Beginning in 2000, there are two tax credit rates applied to gifts in Quebec. The activation flag, `QGIFTHCR`, is used to implement the calculation. Allowable gifts up to `QGIFTL1` use the `QNTCR`. The higher credit rate `QGFTCR` is applied to allowable gifts over `QGIFTL1`. The total value of the tax credit is `imqchatc`.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
QAXM	Quebec age exemption/amount
QAXPI	Quebec age exemption reduction phase in
QAXRR	Quebec age exemption reduction rate
QAXTD	Quebec age exemption income turn down
QBXN	Quebec basic personal exemption/amount
QCALRFLG	Quebec combined age, living alone retirement credit
QCAPGFLAG	Capital gains deduction flag
QCAPGIR	Quebec capital gains inclusion rate
QCHATNF	Quebec charitable donations maximum % net income
QEEXPDED	Quebec employment expenses deduction application flag
QEMPLOFLAG	Database variable(emplo) activation flag
QGFTCR	Quebec credit rate for gifts over upper limit
QGIFTFLG	Quebec max to gifts to Federal/Province/Crown activation flag
QGIFTHCR	Quebec higher tax credit on large gifts activation flag
QGIFTL1	Quebec minimum gift limit subject to higher credit rate
QGIFTOPT	Quebec gifts as tax credit
QHSC	Quebec Health Services Fund Contribution table
QHSCDIR	Quebec Health Services Fund Contribution Dividend inclusion rate
QHSCFLAG	Quebec Health Services Fund Contribution calculation flag
QHSOASFG	Quebec Health Services Fund Contribution OAS Deduction flag
QITSFSEW	Quebec improved tax system for self-employed worker activation flag
QMAXDX	Quebec maximum disability deduction/amount
QMEDALL	Quebec medical allowance maximum lower limit
QMEDANF	Quebec medical allowance lower limit net income fraction
QMEDINC	Income definition for Que. refundable tax credit for medical expenses
QMEDOPT	Quebec Medical Tax Credit option
QNFSDED	Quebec deduction of net federal supplements (SPA and GIS) from net income flag
QNORTHFLAG	Database variable(north) activation flag
QNTCR	Quebec nominal tax credit rate
QPARTLOFLAG	Database variable(partlo) activation flag
QREFOPT	Quebec deduction/credit option [1=deduction,2=credit]
QREPNETFG	Social program repayments reduce Quebec net income flag
QSADED	Quebec deduction of social assistance benefits from net income flag
QSPBFLAG	Quebec inclusion of social program benefits in income flag
QSTD	Quebec standard deduction from net income
QYIDL	Quebec deduction limit for investment income
QYPDL	Quebec deduction limit for pension income
QYPPI	Quebec deduction phase-in for pension income
QYPRR	Quebec deduction reduction rate for pension income
QYPTD	Quebec deduction turn down for pension income

INPUT VARIABLES:

hhnin	Number of individuals in household
idage	Age
idcapgex	Capital gains exemptions (254)
idcarry	Carrying charges (221)
idcfrh	Relationship to census family head
idcharit	Charitable donations (340)
idclos	Allowable other years capital loss (253)
iddalimo	Alimony paid (220)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
idemplo	Employee home relocation loan dedn (248)
idgifts	Gifts to Canada/provinces/culture (342)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiint	Interest income (121)
idinspo	Person's spouse [pointer]
idipens	Pension income (115)
idmedgro	Medical expenses, gross (330)
idnclos	Allowable other years non-capital loss (252)
idnorth	Northern deductions (255)
idpartlo	Limited partnership losses (251)
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idspoflg	Person has spouse
idstkded	Stock option deduction (249)
imigis	GIS benefits
imioas	OAS benefits
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imninc	No income flag
imoasr	OAS recovery
imqalexp	Quebec allowable employment expenses
imqcapgt	Quebec taxable capital gains
imqcppse	Quebec self-employ. QPP/CPP Cont. deduction
imqidivt	Quebec taxable dividends
imqiloss	Quebec Modelled Business investment losses (217)
imqinet	Quebec net income
imqitot	Quebec total income
imqsfflg	Quebec simplified tax form flag 0=general 1=simplified
imrepay	Social Benefits Repayments
imuibr	UI benefit recovery

OUTPUT VARIABLES:

imqatc	Quebec age tax credit
imqaxm	Quebec age personal exemption
imqbtc	Quebec basic tax credit
imqcapgx	Quebec modelled capital gains deduction (254)
imqchara	Quebec allowable charitable donations(calc)
imqchatc	Quebec allowable charitable donations tax credit
imqdedfn	Quebec all deductions from net income
imqdisex	Quebec disability exemption
imqdistc	Quebec disability tax credit
imqexm	Quebec personal exemptions (Basic+Age)
imqhsfc	Quebec Health Services Fund Contributions
imqhsftc	Quebec Health Services Fund Cont.tax credit
imqintdn	Quebec interest income deduction allowed

imqitax	Quebec taxable income
imqmeda	Quebec medical expenses allowed
imqpendn	Quebec pension income deduction allowed
imqpex	Quebec personal exemptions and deductions
imqritc	Quebec retirement income tax credit
imqstddn	Quebec stand. /medical+charitable allowed
imqstkdd	Quebec modelled Stock option deduction (249)

txque Compute provincial taxes for Quebec

SUMMARY

For residents of Quebec, the calculation of provincial taxes roughly approximates the process of calculating federal taxes. The SPSM divides this task among three functions which are described in another section of this document:

1. txqinet calculates total and net income tax
2. txqitax calculates a provisional value for taxable income subject to updating by txqhstr
3. txqhstr performs the calculation of personal exemptions for dependents and the allocation of deductions between head and spouse

The value of Taxable Income (imqitax) calculated by txqhstr is used to look up a value for Basic Provincial Tax (imbpt) in the tax table (QTX).

The Quebec Dividend Tax Credit (imqdtxc) is calculated as a proportion (QDTCR) of Taxable Dividends (imqidivt) and is subtracted from Basic Provincial Tax to derive Provincial Tax Payable (imtxp). Also subtracted is the Quebec Tax Reduction which is a proportion (QTRP) of Provincial Tax Payable (imtxp).

txsask Compute provincial taxes for Saskatchewan

SUMMARY

When STXFLG is off, Saskatchewan Basic Provincial Tax is a proportion (SPTF) of Basic Federal Tax (imbft). A flat surtax, calculated as a proportion (SFTAX) on Net Income (iminet) is added to Basic Tax.

The 2000 budget announced that Saskatchewan would convert to a tax on taxable income starting in 2001. When the tax on taxable income flag is turned on (STXFLG), a provincial tax table (SPTX) is applied on taxable income (imitax) in order to get the gross provincial tax (imprvtax). Non-refundable tax credits are calculated using the non-refundable tax credit rate (SPNTPCR) and are applied against gross provincial tax in order to get the basic provincial income tax (imbpt).

The non-refundable credits which are calculated are:

impbtc	Basic amount	(SBXM)
impatxc	Age amount tax credit	(SAXM, SAXRR, SAXTD, SAXPI)
impmartc	Married and equivalent-to-married tax credit	(SMXM, SMXMT, SEMXM, SEMXMT)
impcgtc	Caregiver tax credit	(SCGTC, SCGTCFLG, SCGTCTC, SCGTCTD, SCGTCTK)
impchrctc	Charitable donations	(SCHATL1, SCHATR1, SCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(SMAXDX)
impdtxc	Dividend tax credit	(SDTCR)
impedtxc	Education tax credit	(SEDXPM, SMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(SYPNDL)
imptutxc	Tuition Tax credit	(SMAXET)
impuictc	EI contributions tax credit	
imsctxc	Saskatchewan Non-refundable child tax credit	(SCNTC)
imssstxc	Saskatchewan senior supplement tax credit	(SSSTC)

The option to apply a minimum tax is controlled using SAMTOPT.

Adjusted Saskatchewan Tax Payable (before a tax reduction is applied, is stored in the temporary variable a) is calculated as Basic Saskatchewan Tax (imbpt) plus a proportion (SSF) of Basic Saskatchewan Tax exceeding the Saskatchewan Surtax Level (SSCI).

Saskatchewan also implements a system of tax reductions for senior citizens and persons with dependent children. The Basic Tax Reduction (STRBR) is augmented by the Senior Citizen's Tax Reduction (STRSC) if the filer is age 65 or older. A tax reduction per child under 18 (STRPC) up to a maximum total for all children (STRCL) is also added. The number of children claimable for this tax reduction is taken from innfach, the number of children eligible for Family Allowances.

The total potential tax credit is reduced by a proportion (STRRR) of the tax credit exceeding Adjusted Saskatchewan Tax Payable a to derive Reduced Saskatchewan Tax Payable imtxp.

Starting in 1992, a surtax (SDSF) for the reduction of the deficit is applied to the tax (imtxp). In 1995, an amount (SDSRA) was deducted from the surtax.

The Saskatchewan labour-sponsored venture capital credit is modeled (implvctc). A study was made showing that the majority of Canadians who contribute to labour-sponsored funds claim both federal and provincial credits. Therefore the gross contributions from the Greenbook are imputed onto the database. The Saskatchewan provincial credit is modeled as

SLVCRT times the gross amount up to SLVCMAX. The credit cannot be more than provincial taxes (imtxp).

The Saskatchewan Child Benefit and Saskatchewan Employment Supplement announced in the 1998 budget are modeled. When the SCBFLG is activated, families receive a benefit which depends on the number of children in the family (SCB1, SCB2, and SCB3). The benefit is reduced in two stages. Net family income greater than SCBTD1 and less than SCBTD2 is reduced at a rate SCBRR1 which depends on the number of children in the family. The benefit is further reduced at a rate of SCBRR2 for income over SCBTD2.

The Saskatchewan Employment Supplement is a monthly program. In the SPSD/M, the program is modeled in a yearly fashion. The maximum benefit is derived by multiplying a family's employment income in excess of SESCO (up to a maximum of SESMXIP) by a rate (SESR) which depends on the number of children in the family. The benefit is reduced for any family net income in excess of SESTD by a SESRR rate. The supplement started in mid-1998 and hence a phase-in rate SESPI was applied.

The estimate resulting from the SPSD/M may differ from the administrative totals. In modeling the program, employment income is assumed to be evenly distributed during the year. No maintenance income (e.g. child or spousal support) is added to employment income. The program is administered monthly with eligibility being determined depending on each month's income.

The Saskatchewan Sales Tax Credit announced in their 2000 Budget is now modelled. The Saskatchewan Sales Tax Credit is activated when SSTCFLAG is set to 1.

The Saskatchewan Sales Tax Credit was introduced in 2000 and became effective April 1, 2000 to offset the effect of sales taxes on lower income earners. SSTCPI represents the phase in rate for the program. The Saskatchewan Sales Tax Credit (imsstc) will consist of an adult component and a child component. This credit will be fully refundable and will be assigned to the spouse with the highest income.

The adult component of the Saskatchewan Sales Tax Credit will rise at a rate of SSTCBASPIR of individual net income up to a maximum (SSTCBAS). It will be reduced at a rate of SSTCRR as family net income increases above SSTCBASTD. An individual will also be eligible for SSTCSP in additional benefits for a dependent spouse or equivalent. This amount will be reduced at a rate of SSTCRR as family net income rises over SSTCSPTD.

The child component of the Saskatchewan Sales Tax Credit will provide an additional SSTCKID per child. For two-parent families, the maximum child component will be SSTCKID + SSTCKID. For single parent families, the first child will be eligible for the adult benefit of SSTCSP and the maximum child component will be SSTCKID. The child component of the Credit will be reduced at a rate of SSTCRR as family net income rises over SSTC1KIDTD for families with one qualifying child. For families with more than one qualifying child, the Credit will be reduced at a rate of SSTCRR as family net income rises over SSTC2KIDTD.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTCINC	CTC family income scaling factor
PYINC	Deflator to calculate previous year income
SAMTOPT	Sask. alternative minimum tax option (1=none, 2=% fed, 3=fed adjusted net income)
SAMTPCTF	Sask. amt rate as pct of additional fed tax due to minimum tax
SAMTTX	Sask. amt rate as tax on adjusted income
SAXM	Sask. Age Amount
SAXPI	Sask. Age Amount phase in rate for 1994 and beyond
SAXRR	Sask. Age Amount credit reduction rate
SAXTD	Sask. Age Amount net income turndown
SBXM	Sask. Basic Personal Exemption/amount
SCB1	Sask Child Benefit max for 1st child
SCB2	Sask Child Benefit max for 2nd child
SCB3	Sask Child Benefit max for 3rd and additional child
SCBFLG	Sask Child Benefit activation flag
SCBRR1	Sask Child Benefit 1st reduction rate [number of kids]
SCBRR2	Sask Child Benefit 2nd reduction rate [number of kids]
SCBTD1	Sask Child Benefit 1st turndown
SCBTD2	Sask Child Benefit 2nd turndown
SCGTC	Sask. Caregiver Tax Credit
SCGTCFLG	Sask. Caregiver Tax Credit activation flag
SCGTCTC	Sask. Caregiver tax credit take-up rate by age of elderly [age,rate]
SCGTCTD	Sask. Caregiver Tax Credit Turn Down Income
SCGTCTK	Sask. Caregiver tax credit take-up rate by income level [employment income,rate]
SCHATL1	Sask. Charitable Donations amount level 1
SCHATR1	Sask. Charitable Donations tax credit rate 1
SCHATR2	Sask. Charitable Donations tax credit rate 2
SCNTC	Sask. non-refundable child tax credit amt per child
SDSF	Saskatchewan provincial deficit surtax fraction
SDSRA	Saskatchewan deficit surtax reduction rate
SDTCR	Sask. dividend tax credit rate
SEDXPM	Sask. Education Amount per month
SEMXM	Sask. equivalent to married amount
SEMXT	Sask. equivalent to married turndown level
SESCI	Sask Employment Supplement cut in level
SESMXIP	Sask Employment Supplement maximum benefit income point
SESPI	Sask Employment Supplement phase-in
SESR	Sask Employment Supplement benefit rate [number of kids]
SESRR	Sask Employment Supplement reduction rate
SESTD	Sask Employment Supplement turndown level
SFTAX	Saskatchewan provincial flat surtax rate on net income
SLVCMAX	Maximum Sask. labour-sponsored funds tax credit allowed

SLVCRT credit	Percent of Sask. labour-sponsored funds cost allowed as
SMAXDX	Sask. Maximum Disability deduction/amount
SMAXET	Sask. maximum on transfer of education and tuition amount
SMXM	Sask. married amount
SMXMT	Sask. married amount turndown level
SPNTRC	Sask. provincial non-refundable tax credit rate
SPTF	Saskatchewan provincial tax fraction
SPTX	Sask. tax table [taxable income,basic provincial tax]
SRDOPT	Saskatchewan tax reduction calculation option
SSCI	Saskatchewan surtax cut-in
SSF	Saskatchewan provincial high income surtax fraction
SSSTC	Sask. senior supplement tax credit
SSTC1KIDTD child	Sask. sales tax credit child amount turndown if only 1
SSTC2KIDTD child	Sask. sales tax credit child amount turndown if more than 1
SSTCBAS	Sask. sales tax credit base amount
SSTCBASPIR	Sask. sales tax credit base amount phase in rate
SSTCBASTD	Sask. sales tax credit base amount turndown
SSTCFLAG	Sask. sales tax credit activation flag
SSTCKID	Sask. sales tax credit child amount
SSTCPI	Sask. sales tax credit phase in
SSTCRR	Sask. sales tax credit reduction rate
SSTCSP	Sask. sales tax credit spousal amount
SSTCSPTD	Sask. sales tax credit spousal amount turndown
SSTR	Saskatchewan spousal & married equivalent tax reduction
STRBA	Saskatchewan tax reduction base amount
STRBR	Saskatchewan basic provincial tax reduction
STRCL	Saskatchewan child tax reduction limit
STRPC	Saskatchewan tax reduction per child
STRRR	Saskatchewan tax reduction reduction rate
STRSC	Saskatchewan tax reduction for senior citizens
STXFLG	Sask. tax on taxable income activation flag
SYPNDL	Sask. Pension Income Deduction Amount

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfnkids	Number of children in census family
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
efin	First person in economic family [pointer]
efnpers	Number of persons in economic family
hhncf	Number of census families in household
hhnef	Number of economic families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcfrh	Relationship to census family head
iddisab	Disability status
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducm	Eligible months of education allowance

idefrh	Relationship to economic family head
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idlabtxg	Gross Labour funds bought (413)
idprvftc	Provincial foreign tax credit (Form T2036)
idrand	Random numbers [array]
idsex	Sex
idtuitn	Tuition fees (320)
imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts (calculated)
imcppse	CPP contributions deduction for self-emp
imcqqpc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepmi	Dependant's net income
imidivt	Dividend income (taxable)
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
immarex	Married exemption claimed
immartxc	Married tax credit claimed
immeda	Medical expenses allowed (computed)
imnfach	Number of family allowance children claimed
imuic	UIC contributions
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imninc	No income flag
imnptc	Non-refundable provincial tax credits
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgtc	Prov Caregiver Tax Credit Level
impcgtcp	Prov Dependant caregiver tax credit amount
impchrctc	Prov Charitable Donations tax credit
impcpptc	Prov CPP/QPP contributions tax credit
impctxct	Prov tax credits transferred from children
impdistc	Prov Disability tax credit
impdtxc	Provincial dividend tax credit
impedtxc	Prov Education tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmedtc	Prov Medical Expenses tax credit
impnit	Provincial net income tax
imppentc	Prov Pension Income tax credit
imprvtax	Prov gross provincial tax

impstxct	Prov tax credits transferred from spouse
impsur	Provincial surtax
imptaxcr	Prov total tax credits
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
impttxct	Prov total tax credits transfered
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imscb	Saskatchewan Child Benefit
imsctxc	Saskatchewan Non-refundable child tax credit
imses	Saskatchewan Employment Supplement
imssstxc	Saskatchewan senior supplement tax credit
imsstc	Saskatchewan refundable sales tax credit
imtxp	Provincial income tax payable

ui Compute UI benefits

SUMMARY

Unemployment Insurance benefits are calculated by a set of functions which mimic application of UI regulations to individual employment and claim histories. These histories are summaries of administrative data from a 1% sample of persons with some UI claim activity . Benefits are first calculated on a claim basis. Adjustments are then made to allow for claims overlapping more than one calendar year. Finally, taxable benefits received by individuals within a calendar year are determined.

The Employment Insurance reforms were added to the model. When UIEIOPT=2 then these major reforms are in effect. The changes to fishing benefits have not yet been implemented.

1 - Qualifying for benefits is now based on hours of work instead of weeks of work

Since the SPSPD does not contain total hours of work, these are derived using the weeks of work prior to claim (ucwwork) multiplied by a new variable: the average weekly hours of work (ucwchr) which was imputed from the Survey of Labour and Income Dynamics. For more information, see UIREGHRMIN, UIMATHRMIN, UISICHRMIN, and UIEIHWCFC.

As for fishing benefits, qualification is based on earnings in the past 31 weeks. These are derived using weeks of work prior to claim (ucwwork) and average weekly earnings (ucern). It is assumed that the weeks ucwwork occurred immediately prior to the start of the claim. See UIFSHERMIN.

2 -The Family Income Supplement was added

When UIEIFSFLG is set to 1, the Family supplement is calculated. The total amount of the family supplement paid on a claim is ubclmfs. The total amount of family supplement paid on a claim in the calendar year is ubcalfs.

The Family Supplement was introduced as part of the Employment Insurance system reform introduced in 1995. It increases the basic benefit of families with low income. It replaces the older program which gave an enhanced rate for individuals with low income (in the SPSD/M this older program was controlled by UIENSRATE, UIDEPOPT, UIENSRTCO).

There are two methods of calculating the Family Supplement. When UIEIFSOPT is set to 1, then family supplement is directly tied into the Canada Child Tax Benefit (imfcben). Families which are eligible for the Child Tax Benefit receive the weekly amount of the benefit in addition to their regular Employment Insurance. It is reduced at a rate (UIEIFSRR) over incomes greater than UIEIFSRL.

Some simplifications were made in order to implement this program in the SPSM. The calculation of the Canada Child Tax Benefit is done after the calculation of EI in the model since it requires net income. But it requires the previous year's net income which is estimated as PYINC times the current year's net income.

When the Family Supplement is activated, the tax/transfer driver (drv) is run through twice per eligible household. The first time, no one will get a family supplement since the child tax benefit is equal to zero. The value of the benefit is saved (in ccept) and drv is called again. This time, the previously saved value for the child tax benefit is used to calculate the family supplement. The family supplement will be slightly inconsistent with the child tax benefit since the latter will be recalculated and may be slightly smaller than the one used for deriving the family supplement since family net income will increase due to the family supplement.

Another simplification in deriving the family supplement derives from the fact that the SPSM assumes that the Child Tax Benefit is given in one lump sum amount in July. Therefore in the case of the Family supplement, the rules governing the Child Tax Benefit may be a year off if the benefit is received in the first half of the year.

When UIEIFSOPT is set to 2, the family supplement is calculated independently of the child tax benefit. First the number of children under the age of 7 is calculated (imuiydeps). By going through the drv twice, the family's net income (prior to the addition of the family supplement) is available and the previous year's income is derived by multiplying it by PYINC. The family supplement is then derived by looking up the base value (UIEIFS1 for families with 1 child, UIEIFS2 for families with 2 children, and UIEIFS3 for families with 3 or more children). A supplement for each child over and above the third is added (UIEIFSTOPUP) as is a supplement for each child under the age of 7 (UIEIFSYNG).

The Family supplement rules changed on July 1999. Since the methodology under UIEIFSOPT = 1 would be off by a year, it was decided to treat all of 1999 under the methodology introduced in July 1999 (UIEIFSOPT = 2).

Under both options, EI weekly benefits including the family supplement cannot exceed a proportion (UIEIMFSP) of the claimant's weekly earnings (ubern). Nor can EI benefits, including the family supplement exceed the base rate (UIEIRATE) times the maximum weekly earnings (UIERNMAX).

Also, under both options, when the UIEIFIFLG is turned on, people who receive the family supplement are exempted from the intensity rule.

3 - The Intensity Rule

For persons receiving regular or fishing EI benefits and who did not receive the Family Income Supplement, the intensity rule was applied. The benefit rate (UIEIRATE) depends on the number of weeks of EI collected in the past. See UIEIFIFLG, UIEIRATE, UIEIYRS, ubeiwbp, ucy1, ucy2, ucy3, ucy4, ucy5 for more details.

4 -The Minimum Divisor

In order to obtain their maximum benefits, EI claimants must work two weeks more than the minimum entrance requirements. Parameters were added to allow users to model this change and to add the behavioural response they deem suitable. This change may be modeled using UIEIDIVOPT, UIWK26, UIBXWK, AND UIEIDIV.

5 -Minor Changes

There was a minor change in the method used to derive training weeks and training benefits.

The method of using the UI regular benefit weeks adjustment factor UIREGWKFCT was adjusted.

Program Description

Unemployment insurance is an income support program financed jointly by employees, employers and the federal government. It is intended to provide income maintenance during temporary interruptions in employment. As such, it is not a universal program. Among those excluded from coverage are persons who do not participate in the labour force, the self-employed (other than fishermen) and persons who have exhausted benefit entitlements.

SPSM Implementation

The SPSM implementation of the UI program has distinct steps representing application of program regulations to a given claim. The function ui operates as a controller which calls the sub-functions which apply UI regulations to each claim and each UI claimant within a household and returns the benefits received by individuals for the calendar year. Claimants may have one or two claims overlapping the survey calendar year. Payments within the calendar year are determined assuming benefits are paid on consecutive weeks.

For SPSM purposes, the unemployment regions are urban size classes within each province. These are not the regions defined for administration of the UI program. The use of proxy unemployment regions is required to ensure data confidentiality.

For purposes of determining entitlements, the claim histories include the initial claim type `ucbtyp` (i.e., Maternity, Sickness, Retirement, Fishing or Regular) and a type change flag (i.e., indicating that a Sickness claim, for example, was changed to a Regular claim within the Initial Phase). SPSM deems the type change to have taken place immediately after the claim is established and does not attempt to subdivide the Initial Phase into Special and Regular periods. Since type change takes place, the special benefits totals (e.g., Sickness benefits) can not be determined by eliminating the type (e.g., by setting eligibility requirements high) and calculating the reduction in benefits. A second claim type (`ucmtyp`) is also imputed. If there was more than one type of benefit received within a claim, `ucmtyp` represents the claim type which had the majority of weeks. By turning on `UIEIMTYPFLG`, `ucmtyp` is modelled instead of `ucbtyp`.

The UI algorithm has no behavioral response capacity, so that, for example, no new claims can be created. Similarly, the duration of modeled claims does not exceed observed durations. In the latter case, the assumption is that individuals would not increase durations on claim, if their entitlements were increased. However, no restriction is placed on durations within each phase. Consequently, the elimination of a phase need not reduce the overall duration of a claim.

There are several sub-functions contained in the `ui` function. The first called is `uicl` which calculates benefits for a single claim. `uicl` does this by first calling three sub-functions which test for eligibility requirements based on claim type, repeat claim status, and regional unemployment rates (`uielent`, `uielrep`, `uielrge`). `uicl` next calls three sub-functions which determine the weeks of entitlement in the Initial, Labour Force Extended and Regional Extended Phases (`uiwkbas`, `uiwklfe` and `uiwkrge`). If a second claim is required `uicl` is called again. Finally `ui` determines the dollar benefit. Each function and sub-function are briefly described below.

ui

The `ui` function serves to pass information about each individual with a UI claim in a household to `uicl`. If an individual has more than one claim, modeled weeks of benefits in the qualifying period are computed for the first claim and passed to `uicl` when the second claim is processed. UI benefits for a calendar year are returned.

uicl

The sub-function `uicl` processes distinct claims from the information passed to it by `ui` (see list of input variables). In the event of a repeat claim, `ui` passes information about modeled claim activity in the qualifying period. Modeled changes to UI regulations may produce important differences in first claim activity, thereby effectively changing the status of the second claim.

The `uicl` function operates at a claim rather than an individual level. It calls `uielent`, `uielrep` and `uielrge` to establish eligibility. It then changes the type of eligible claims, where appropriate.

Once a claim is established, `uicl` calls `uiwkbas`, `uiwklfe` and `uiwkrge` to determine

entitlements in each of the Initial, Labour Force Extended and Regional Extended Phases, respectively. The claim is represented by four pointers which identify:

Pointer #1 - 1st week of benefits (following waiting period)

Pointer #2 - 1st week of Labour Force Extended benefits

Pointer #3 - 1st week of Regional Extended benefits

Pointer #4 - week after claim termination.

Weeks are identified by integers with the week of January 1, 1984 being zero. The differences between succeeding pointers will initially equal the entitlement on the appropriate phase. uiclm then calls a utility function uisqz which ensures that interval between #1 and #4 does not exceed the original claim or the maximum allowable duration of a claim. A subsequent call to uisqz produces a second set of (windowed) pointers that do not include any weeks outside the calendar year.

Benefits are the product of phase weeks times the weekly benefit rate for each phase summed over phases. Claim and calendar year benefits are calculated separately.

uielent

The uielent sub-function applies eligibility tests based on the minimum weeks of insurable employment in the qualifying period required for each initial claim type. These are basic tests which may be superseded by special tests applied to repeaters and other regular claimants. The function sets a flag indicating eligibility status.

uielrep

The uielrep function performs special eligibility tests that apply to repeaters only. The required weeks of insurable employment depend on the regional unemployment rate and on weeks of benefits in the qualifying period. The function performs a two dimensional table lookup to determine whether eligibility is established. The function sets a flag indicating eligibility status.

uielrge

Claims that are initiated as regular claims are subject to variable entrance requirements that depend on the regional unemployment rate. The function uielrge performs the table lookup necessary for these tests. The function sets a flag indicating eligibility status.

uiwkbas

The function uiwkbas determines entitlements in the Initial Phase. For special benefit types (i.e., claims that do not change from maternity, fishing, sickness or retirement), this is the total claim entitlement and is determined by a table lookup. For regular claims, entitlements, up to a maximum number of weeks, are determined in proportion to weeks of insurable employment in the qualifying period up to a maximum number of weeks.

uiwklfe

The function *uiwklfe* determines entitlements in the Labour Force Extended Phase. As in the Initial Phase, entitlements are determined in proportion to weeks, above a minimum, of insurable employment in the qualifying period.

uiwkrge

The function *uiwkrge* determines entitlements in the Regional Force Extended Phase. Entitlements are determined by the regional unemployment rate.

Discrepancies in the benefits determined by the UI algorithm compared with administrative data result from a combination of factors which could produce both over and underestimation. Among the more important factors contributing to discrepancies are sampling and response error in the SCF data, sampling error in the UI administrative data, errors associated with categorical matching and conversion (i.e., imputing benefits to correct for item non-response) and errors arising from the use of proxy unemployment regions. The following table compares published 1984 UI benefits with values derived from the database and by application of the UI algorithm.

1984 UI Benefit Payments in Millions of Dollars

Province	Published ¹	Reported Re-weighted ²	Re-weighted & Converted ³	Simulated 60% Benefit Rate ⁴	Effective Benefit Rate ⁵
NFLD	499	440	515	509	495
PEI	98	81	88	93	91
NS	418	309	399	402	387
NB	494	378	505	465	452
QIE	3022	2,552	3,349	3,043	2,922
ONT	2,517	1,851	2,687	2,442	2,348
MAN	296	245	301	296	281
SASK	242	192	257	248	236
ALTA	923	754	893	889	853
BC	1,144	1,195	1,599	1,468	1,404
Total	9,952	7,996	10,591	9,856	9,470

¹Unemployment Insurance Statistics, Cat. 73-202s Gross disbursement in 1984 before correction for retroactive payments, overpayments, cancelled cheques, etc.

²Respondents' UI benefits with household weights

³Non-response model employed to impute benefits

⁴UI algorithm applied to matched claim data with benefit rate 60% of weekly insurable earnings

⁵UI algorithm with benefit rate equal to average weekly benefits observed in the claim data

The column labelled Published represents Statistics Canada's figures for UI benefit payments disbursed in 1984. Adjustments to represent payments to 1984 claimants will be less than 1% of the total.

The column labelled SCF Re-weighted represents UI benefits reported by SCF respondents

(employing 'raked weights'). Response errors in the SCF are a major source of error in these estimates. The SCF Re-weighted and Converted column represents the SCF sample augmented with imputed benefits. Imputation has been carried out until the weighted number of beneficiaries agrees (approximately) with administrative data. Model based imputation can only provide an approximate correction for response errors. The columns labelled Modeled 60% Benefit Rate and Modeled Effective Benefit Rate both represent values derived from sampled UI administrative data. The algorithm does not explicitly deal with the Training, Work Sharing or Job Creation components of the UI program. Consequently, the modeled benefits should be lower than actual benefits (i.e., the difference relating to benefit payments on these special programs in excess of that which might have been paid under the regular program). Additionally, use of proxy regional unemployment rates introduces error in testing eligibility and in determining entitlements. These errors will tend to reduce modeled benefits because modeled claim durations may be shorter and can not be longer than observed durations. However, comparison of modeled benefits employing 60% benefit rates to those employing effective benefit rates indicates that the overall percent error of the modeled 60% results (i.e., -0.96% or within the error of the published values) is due in part to compensating errors (i.e., over and underestimation).

Takeup rate to adjust UI/EI

Error! Not a valid filename.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
PYINC	Deflator to calculate previous year income
UIBASFLAG	Basic phase calculation flag (UI and EI)
UIBASOPT	UI reform option [1=normal, 2=Apr'89] (UI and EI)
UIBASRATE	Benefit rate for basic phase (UI only)
UIBXWK	User define behavioral response to minimum divisor
[uer][rate] (EI only)	
UIDEPOPT	UI dependency option [1=normal, 2=Feb'94] (UI only)
UIEFFFLAG	Observed effective weekly benefit rate flag (UI and EI)
UIEIDIV	EI minimum divisor [uer][divisor] (EI only)
UIEIDIVOPT	EI minimum divisor options (EI only)
UIEIFIFLG	EI intensity rule exemption for family supplement receivers (EI only)
UIEIFS1	Max fam supplement 1 child (EI only)
UIEIFS2	Max fam supplement 2 children (EI only)
UIEIFS3	Max fam supplement 3+ children (EI only)
UIEIFSFLG	UI EI calculate family supplement flag (EI only)
UIEIFSOPT	UI EI calculate family supplement option (EI only)
UIEIFSRL	UI EI family supplement reduction level (EI only)
UIEIFSRR	UI EI family supplement reduction rate (EI only)
UIEIFSTOPUP	Max fam supplement top up for more than 3 kids (EI only)

UIEIFSYNG Max fam supplement top up for young children (EI only)
 UIEIHWCFC EI hours to weeks conversion factor (hours/week) (EI only)
 UIEIMFSP EI Maximum family supplement percent of earnings (EI only)
 UIEIMTYPFLG Flag to model main benefit type (UI and EI)
 UIEIOPT UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
 UIEIRATE Benefit rate under EI reform [Past Wks ben][Rate] (EI only)
 UIEITKP UI EI takeup rate [index] : index based on prov, sex, age, weeks
 UIEITRNFLAG Modeling of UI training benefits flag (UI and EI)
 UIEITRNREGFLG UI training benefits turned into regular benefits (UI and EI)
 UIEIYRS Number of years of previous EI benefits calculated (EI only)
 UIENSRATE Enhanced rate for basic phase (UI only)
 UIENSRTCO Enhanced rate cutoff (UI only)
 UIENTFLAG Basic entrance requirements flag (UI and EI)
 UIERNMAX Maximum insurable earnings (UI and EI)
 UIEWK Entitlement (weeks) [wkwrk, uer] (UI and EI)
 UIEXTMATWKS Additional weeks for maternity - behavioural response (UI and EI)
 UIFLAG UI/EI Activation flag (UI and EI)
 UIFSHERMIN Min. earnings to qualify for fish. benefits [unempl. rate] (EI only)
 UIFSHMINWK Minimum weeks to qualify for fishing benefits (UI only)
 UILFEFLAG Labour force extended phase calculation flag (UI only)
 UILFEMIN Weeks worked in qualifying period [UILFEWKS index] (UI only)
 UILFERATE Benefit rate for labor force extended phase (UI only)
 UILFEWKS Weeks LFE entitlement [UILFEMIN] (UI only)
 UIMATHRMIN Minimum hours to qualify for maternity benefits (EI only)
 UIMATMINWK Minimum weeks to qualify for maternity benefits (UI only)
 UIMAXBASWKS Maximum number of weeks - regular (UI and EI)
 UIMAXDUR Maximum duration of a UI claim (UI and EI)
 UIMAXFSHWKS Maximum number of weeks - fishing (UI and EI)
 UIMAXMATWKS Maximum number of weeks - maternity (UI and EI)
 UIMAXPARWKS Maximum number of weeks - parental (UI and EI)
 UIMAXRETWKS Maximum number of weeks - retirement (UI only)
 UIMAXSICWKS Maximum number of weeks - sickness (UI and EI)
 UIQPWKS Additional waiting period for quitters (UI and EI)
 UIQUIRATE Benefit rate for quitters in basic phase (UI and EI)
 UIREGHRMIN Min. hours to qualify for reg. benefits [unempl. rate] (EI only)
 UIREGMINWK Minimum weeks to qualify for regular benefits (UI only)
 UIREGWKFCF UI regular benefit weeks adjustment factor (UI and EI)
 UIREPPREV Weeks of insurable employment [weeks] (UI only)
 UIREPUER Regional unemployment rate [rates] (UI only)
 UIREPWWKD Repeater eligibility requirements [weeks x rates] (UI only)
 UIRETMINWK Minimum weeks to qualify for retirement benefits (UI only)
 UIRGEFLAG Regional extended phase calculation flag (UI only)
 UIRGEMIN Unemployment rate for Regional Extended entitlement [UIRGEWKS index] (UI only)
 UIRGERATE Benefit rate for regional extended phase (UI only)
 UIRGEWKS Weeks Regional Extended entitlement [UIRGEMIN] (UI only)
 UIRGNFLAG Regional requirements flag (UI only)
 UIRGNMIN Regional unemployment rate (UI only)
 UIRGNWKS Weeks required for eligibility (UI only)
 UIRPTFLAG Repeater requirements flag (UI only)

UISICHRMIN	Minimum hours to qualify for sickness benefits (EI only)
UISICMINWK	Minimum weeks to qualify for sickness benefits (UI only)
UITARGET	UI/EI target for the number of cases (UI and EI)
UITRNBINFCT	UI training benefit per week adjustment factor (EI and EI)
UITRNWKFCT	UI training benefit weeks adjustment factor (UI and EI)
UIWAITWKS	Minimum waiting period all claims (UI and EI)
UIWK26	Conversion rate of weeks worked (52 to 26 weeks)
[prob][rate]	(EI only)

INPUT VARIABLES:

cfin	First person in census family [pointer]
cfnpers	Number of persons in census family
hdprov	Province
hdurb	Size of urban area
hhncf	Number of census families in household
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idage	Age
idcfrh	Relationship to census family head
idicapg	Capital gains (actual)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiint	Interest income (121)
idinoth	Other money income (non-taxable)
idinspo	Person's spouse [pointer]
idioinv	Other investment income with net rental
idipens	Pension income (115)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditoth	Other non-government income (taxable)
iditrrsp	Taxable RRSP withdrawals
idnf	Person's nuclear family [pointer]
idninco	No income flag (SPSD variables)
idrand	Random numbers [array]
idspoflg	Person has spouse
iduirank	Predicted ranked likelihood of getting UI
imfcben	Total Federal Child Benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imuidpfg	UI claimants has dependents flag
nfin	First person in nuclear family [pointer]
nfinch	First child in nuclear family [pointer]
nfnkids	Number of children in nuclear family
nfnpers	Number of persons in nuclear family
ubp4	Week # of last payment
ubp4c	Week # of last payment (windowed)
ucbtyp	Claim type
uceff	Effective weekly rate
ucern	Insurable weekly earnings
ucgotpa	Received paternity benefits
ucmtyp	Main Claim type (majority of weeks)
ucquitp	Penalty for voluntary quit
ucrpeat	Repeat claim flag
ucstart	Week claim established
ucstat	Claim status flag
uctpcng	Also received regular benefits
uctrnbr	Training benefit weekly rate

uctrnwk	Weeks of training benefits
ucuer	Local unemployment rate (x10)
ucweeks	Weeks of benefits
ucwkhrr	Weekly hours of work
ucwork	Weeks of work prior to claim
ucy1	Weeks on UI in first year before claim
ucy2	Weeks on UI in second year prior to claim
ucy3	Weeks on UI in third year prior to claim
ucy4	Weeks on UI in fourth year prior to claim
ucy5	Weeks on UI in fifth year prior to claim

OUTPUT VARIABLES:

imiuib	Unemployment Insurance/Employment Insurance benefits
imninc	No income flag
imuibr	UI benefit recovery
imuidpfg	UI claimants has dependents flag
imuiydeps	Number of dependents under 7 for family supplement (EI only)
ubcalfs	Family supplement paid in calendar year
ubcalpd	Benefits paid in calendar year
ubcalwk	Weeks on claim in calendar year
ubclmfs	Family supplement paid on claim
ubclmpd	Benefits paid on claim
ubclmwk	Weeks on claim
ubeiwbp	Weeks of past EI benefits
ubern	Modelled insurable weekly earnings
ubp1	Week # of first payment
ubp1c	Week # of first payment (windowed)
ubp2	Week # of start of second phase
ubp2c	Week # of start of second phase (windowed)
ubp3	Week # of start of third phase
ubp3c	Week # of start of third phase (windowed)
ubp4	Week # of last payment
ubp4c	Week # of last payment (windowed)
ubp5	Week # of last training payment
ubp5c	Week # of last training payment (windowed)

vardef Define structure member as an SPSM variable

SUMMARY

The vardef function (actually a macro) is used to define a new variable to the facilities of the SPSM that make use of variables. Please see the [*Programmer's Guide*](#) for more information.